

MATERIAL FLOW

HANDLING • PRODUCTION • PACKAGING AND SHIPPING

DECEMBER 1953



SEASONS
GREETINGS
from the FLOW Staff

Flow Circulation

{ 35,294 FLOW BASIC
104,247 FLOW QUARTERLY

Catalogues and Specifications
for Individual Products
Available on Request

RACK

ENGINEERING COMPANY

Connellsville, Pa.

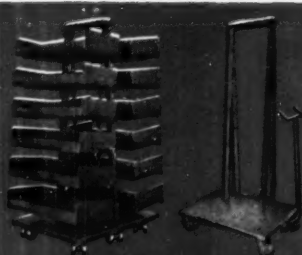
America's Most Complete Line of Materials Handling Equipment

- Convenience and Savings through One Source of Supply
- Immediate Deliveries From Stock
- Complete Plant Surveys
- Factories in
Connellsville, Pennsylvania
London, England
Farnham, Quebec

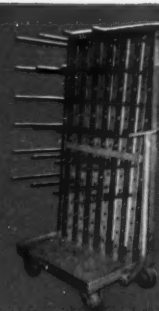
COMPLETE LINE OF
3-DIMENSIONAL MODELS



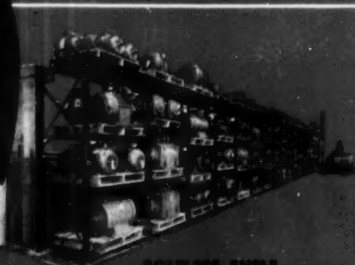
VISUAL PRODUCTION PLANNING, INC.
CONNELLSVILLE, PENNSYLVANIA



SINGLE AND DOUBLE
RACK CONVEYORS
(Patented)



ADJUSTABLE
PEG RACK
CONVEYORS
(Patented)



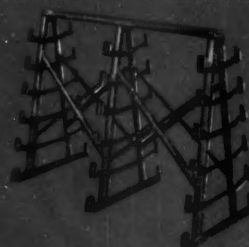
BOLTLESS SHELF
ADJUSTABLE PALLET RACK
(Patented)



COMPLETE LINE
OF SHOP BOXES



ADJUSTABLE ARM
BAR STORAGE RACKS
10-20 Ton Capacity (Pat. Pending)



"A" FRAME
BAR STORAGE RACKS



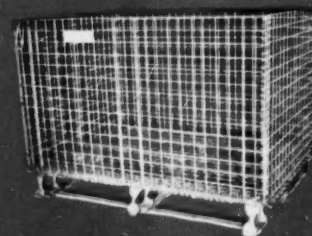
COIL STOCK CARRIERS



TUBULAR STOCK CARRIERS



TUBULAR RACK CARRIERS

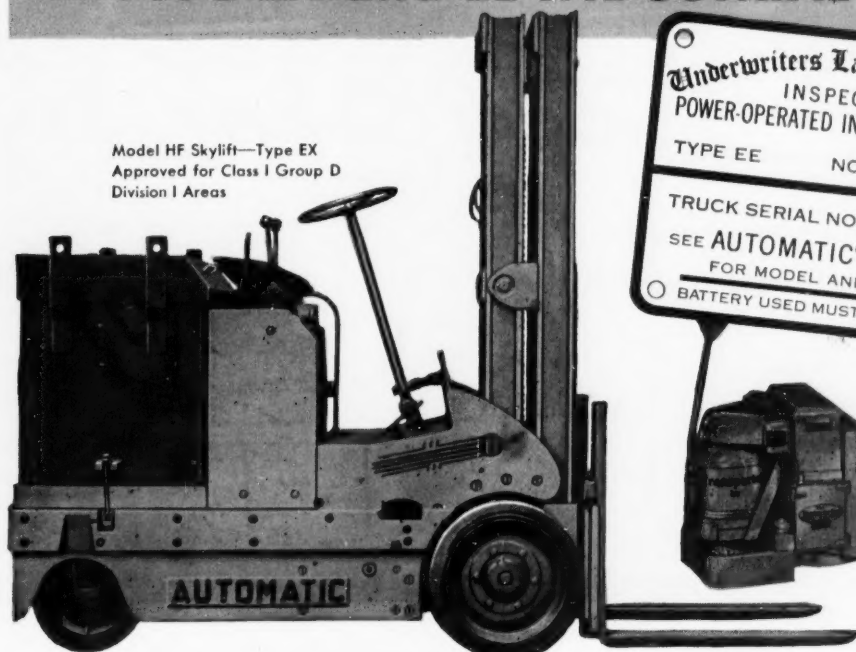


COLLAPSIBLE
WIRE STOCKTAINERS

Circle No. 97 on Reader Service Card for more information

ANOTHER Automatic "FIRST" UNDERWRITERS' LABORATORIES APPROVED TYPE EX and EE INDUSTRIAL TRUCKS

Model HF Skylift—Type EX
Approved for Class I Group D
Division 1 Areas



TYPE EX—UL-APPROVED FOR OPERATION IN HAZARDOUS LOCATIONS

AUTOMATIC proudly announces Underwriters' Laboratories Type EX approval for 2,000, 3,000 and 4,000 pound capacity models of HF Skylift electric trucks... *the first time UL has given any industrial truck approval for use in hazardous locations involving fire and explosion!* Thus, an electric fork truck is at last available, fully acceptable for use in these areas.

Moreover, the UL's specifications are used by the National Fire Protection Association as the basis for insurance policies throughout the country—and these EX rated Skylift trucks therefore meet National Fire Protection Association requirements as well.

The Underwriters' Laboratories Label signifies approval of the complete truck, including battery.

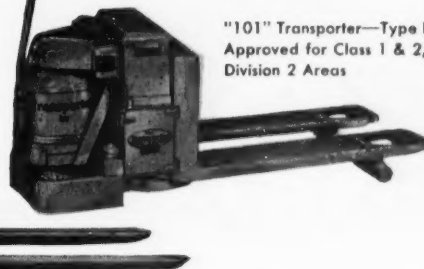
MAIL COUPON TODAY for complete information on these AUTOMATIC models approved by Underwriters' Laboratories!

Automatic®

**World's Largest Exclusive Builder of
Electric-Driven Industrial Trucks**



"101" Transporter—Type EE
Approved for Class 1 & 2,
Division 2 Areas



TYPE EE—UL-APPROVED FOR OPERATION IN SEMI-HAZARDOUS LOCATIONS

In addition, Automatic has been given the UL Label of Approval for EE rated trucks, for operation in semi-hazardous locations. These Type EE trucks include Transporters, Transactors, and Transtackers equipped with Type EE sparkproof and dust-proof protection. *Automatic is the only manufacturer of operator-led trucks with Type EE Underwriters' Laboratories Approval!*

As in Type EX trucks, the National Fire Protection Association also bases its insurance policy recommendations for Type EE trucks on Underwriters' Laboratories specifications.

Clearly, if your materials handling operations involve hazardous or semi-hazardous locations, one of these Automatic industrial trucks is your answer! For complete details, mail coupon below!

Automatic 141 W. 87th St., Dept. X-3
Chicago 20, Illinois

Without obligation, I would like full information on the Underwriters' Laboratories Approved Types "EX" and "EE" trucks manufactured by AUTOMATIC.

Company Name _____
By _____ Title _____
Street Address _____
City _____ Zone _____ State _____

Circle No. 14 on Reader Service Card for more information



B & O Reduces Operating Expenses 4.04% During 1952, Net Income Higher!

According to the 126th Annual Report of the Baltimore & Ohio Railroad Co. for the year 1952, operating revenues dropped by 1.91%, *but increased efficiency brought operating expenses down by 4.04% compared with 1951.* Net income of \$27,308,828 was substantially larger than net income for 1951!

What, you might ask, does all this have to do with Pittsburgh Bulkheads? Simply this: the adoption of Pittsburgh Bulkheads by the B & O is typical of this well-managed railroad's ability to spend money where it will help cut costs.

It was the first railroad to purchase these modern, time and dunnage saving partitions for holding cargo securely. Made of heavy steel tubes and welded wire, they are movable, returnable, easy to install. Pittsburgh Bulkheads enable you to do away with lumber, straps, anchor plates and reduce labor costs. They can be installed by two men in two minutes . . . will pay for themselves in about twenty trips.

For information, write Dept. F, Pittsburgh Steel Products Company, Grant Building, Pittsburgh 30, Pennsylvania.

BULKHEADS

a product of **Pittsburgh Steel Products Company**

A Subsidiary of Pittsburgh Steel Company

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AND AIR CONDITIONING

MATERIAL FLOW

DECEMBER, 1953
VOLUME 9, NO. 3

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FLOW is indexed regularly by Engineering Index, Inc.

SUBSCRIPTION RATES

United States and possessions— \$3.00 per year, \$5.00 for 2 years. Subscriptions in the United Kingdom: £1.10 per annum, payable in Sterling to our London Office.	Canada—\$4.00 per year, \$6.00 for 2 years. Foreign—\$5.00 per year. Single copy price—30 cents.
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Published Monthly

"Acceptance under section 34.64 P. L. & R. authorized at Pontiac, Illinois."

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Is
this
the tire
for
your
needs
?



This is the All Service cushion-type tire — one of the many types in the complete line which Goodyear makes to fit every individual need.

The All Service tread is designed to give you extra traction and durability. The cushion construction means easier riding, less fatigue for the operator — lower maintenance, too.

It is a product of more than fifty years of Goodyear leadership in building outstanding tires for every

type of vehicle.

Selection of the right tire for the job at hand can result in big savings. Goodyear will be glad to send a fully qualified technical expert to your plant — to analyze your operation and to recommend the best tire for your particular problem. No charge, of course. Just write:

Goodyear, Industrial Tire Sales,
Akron 16, Ohio

All Service—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

INDUSTRIAL TIRES

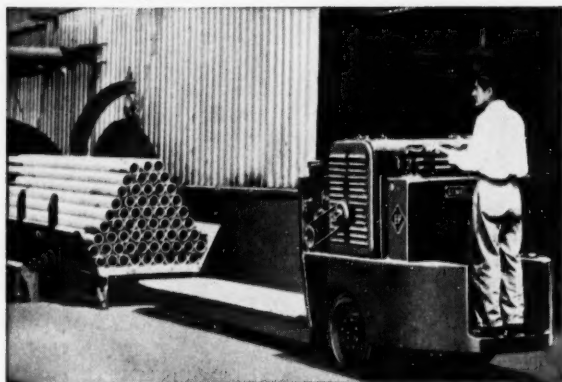
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FLOW • DECEMBER, 1953

**ELWELL
-
PARKER**

Trucks Cost Less to Maintain

HERE'S PROOF



UPKEEP AVERAGES ONLY \$3.36 PER TRUCK-MONTH by two Elwell-Parkers during 63 months' combined use. Trucks operate 3 shifts per day, 6 days per week. Loads average 10 tons.



"NOT A MINUTE LOST DUE TO MECHANICAL FAILURE IN ONE FULL YEAR" by E-P fleet at concrete block plant. One truck operated round-the-clock for 6 months, stopping only for battery changes and lubrication.



MAINTENANCE TIME ONLY 1 HOUR PER TRUCK-MONTH by fleet of 16 low lift platform Elwell-Parkers. These trucks are over 10 years old and currently operate 24 hours per day.



32 YEAR OLD TRUCK STILL IN DAILY SERVICE at Canadian foundry. It transports cores directly into ovens heated to 400°. Here is real proof of E-P built-in dependability.

Why Elwell-Parkers Cost Less to Maintain:—

There are 3 basic reasons for the remarkable service records described above—

1. Packaged unit assemblies permit fast, easy maintenance. Accessibility for servicing is a basic feature.
2. E-P trucks commonly give 15 to 20 years of service because they are ruggedly built. Alloy

steels, forgings and extra reinforcement of critical parts prevent excessive wear or breakage.

3. Preventative maintenance programs and proper operating techniques are carefully explained by an E-P Service Engineer who helps install each new truck and follows up with periodic calls to answer operating and maintenance questions.

ALL PLUS FEATURES are explained in this illustrated, general catalog. Write The Elwell-Parker Electric Co., 4291 St. Clair Ave., Cleveland 3, Ohio.



ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893

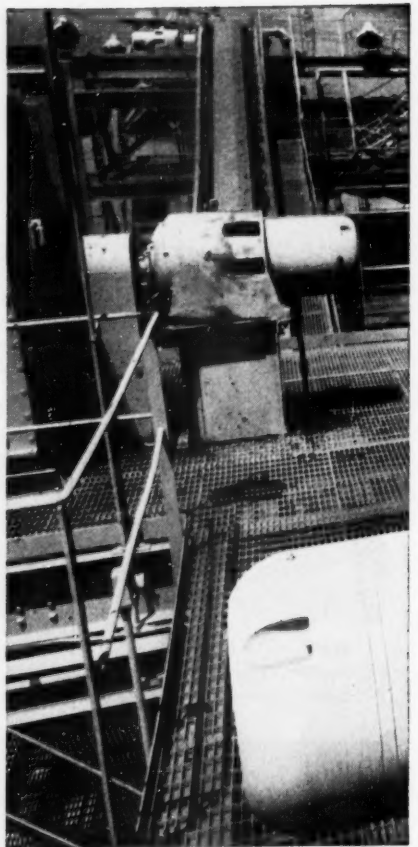
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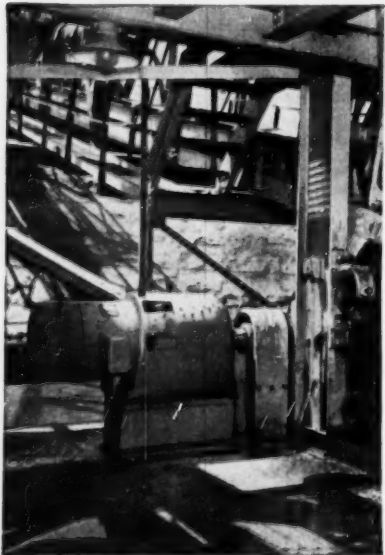
ENGINEERING REPORTS:



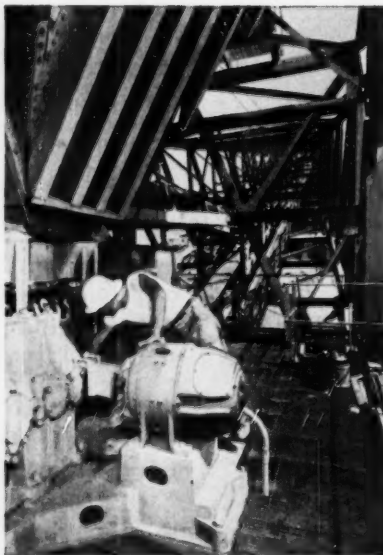
1 RECEIVING HOPPER IS FILLED by this G-E powered Bucyrus-Monahan walking dragline. Coquina shell and sand, in 10 cubic-yard loads, is fed into in-coming hopper of the on-the-spot screening process at the main plant in Bunnell, Florida.



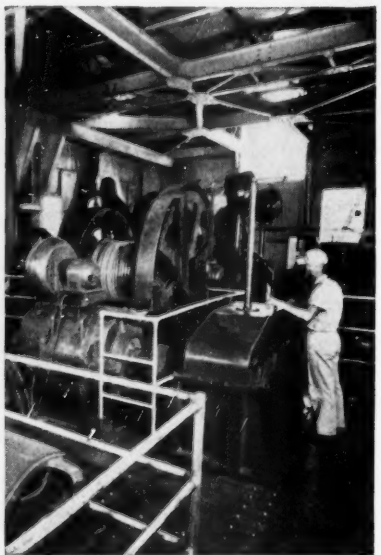
Electrified materials handling



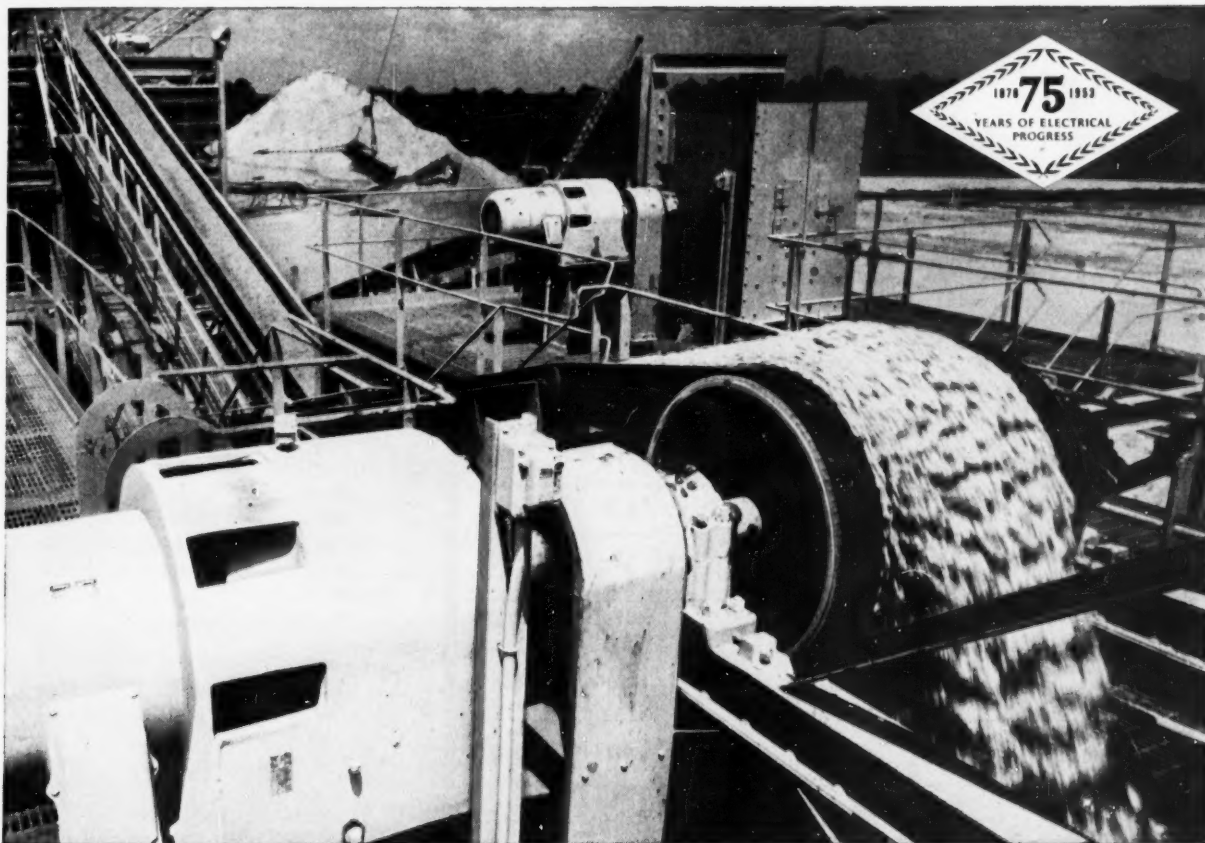
3 MATERIAL MOVES SMOOTHLY, powered by G-E gear motor, to reach peak output of 4000 barrels a day.



4 PROCESSING IS FINISHED and raw coquina shell leaves barge for completely G-E equipped main plant.



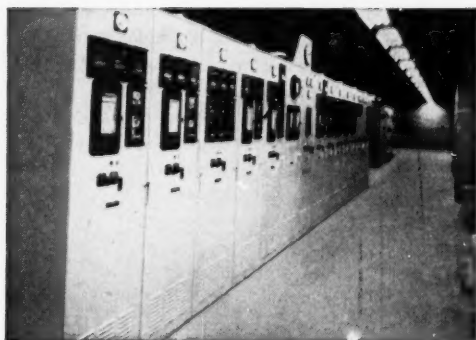
5 STURDY DRIVES, with a-c/d-c generator voltage control, power dragline which handles all coquina shell and sand.



2 SCREENING OPERATION BEGINS as conveyors carry material to various stages of continuous processing to separate excess sand from coquina shell. These five totally enclosed, fan-cooled

G-E Tri-Clad* gear-motors keep conveyor loads going through screening process in this extremely corrosive atmosphere. The entire belt system is electrically co-ordinated for uniform speed.

helps set plant output record



6 CONTROL AND DISTRIBUTION of power is handled through this G-E metal-clad switchgear.

G-E drives help provide smooth, stepless operation at new cement plant

As in any continuous-process industry, the problem of materials handling was of paramount importance at the new Lehigh Portland Cement Company plant in Bunnell, Fla. To facilitate a smooth-flowing, stepless operation F. L. Smidth, process engineers, in co-operation with General Electric application engineers, developed a complete co-ordinated electrical system integrated with each plant process. Today's results show that record output has been achieved by this carefully planned program.

To reach peak efficiency let G-E application engineers work with you and your equipment manufacturers. To see how you can modernize electrically, ask your G-E Apparatus representative about the Progressive Mechanization Program or write to General Electric Co., Section 669-7, Schenectady 5, N. Y.

*Reg. trade-mark of General Electric Co.

Engineered Electrical Systems for Materials Handling

Conveyor drives • Crane drives • Hoist drives • Industrial truck drives and battery chargers

GENERAL  ELECTRIC

Circle No. 53 on Reader Service Card for more information

Here are the facts!



The factual comparisons below show why you'll get longer, better service with Rapistan Cold-Forged Industrial Casters than with any others of comparable price.

YOU BE THE JUDGE

MAKE THESE COMPARISONS YOURSELF	RAPISTAN Cold-Forged Series 40	CASTER A	CASTER B	CASTER C	CASTER D
		<i>Letters represent leading makes of stamped steel casters.</i>			
Method of construction	Cold-Forged	Stamped	Stamped	Stamped	Stamped
Thickness of top plate	1/4"	3/16"	3/16"	3/16"	3/16"
Thickness of caster legs	3/16"	1/8"	1/8"	1/8"	1/8"
Number of raceways—rows of ball bearings	2	2	2	2	2
Smoothness of raceways	.0007"	.0023"	.0030"	.0016"	.0017"
		<i>Figures represent degrees of roughness measured to .0001"</i>			
Ball-bearing surface contacting top plate raceway	.120"	.003"	.030"	.030"	.003"
Ball-bearing surface contacting yoke raceway	.100"	.070"	.030"	.003"	.003"
Protection between wheel-hub and yoke leg	Case hardened, thrust washer	None	None	None	None
Shape of bolt hole for use with previous spacings	Slotted for flexibility	Round	Round	Round	Round

Extra-thick top plate and yoke legs

Two full rows of ball bearings

Hyatt-type wheel bearings

Zerk lube fittings

Hardened outer raceway for wheel bearings

Slotted bolt holes

"Coined" raceways... harder and smoother

"Contour Contact" of bearings on raceways... more surface contact for better load distribution

Case hardened thrust washer

Six wheel types... sizes from 3 1/2" to 8"

NOTE: Rapistan also makes a complete line of outstanding steel forged casters for unusually heavy work.

GET ALL DETAILS on Rapistan caster superiority from this illustrated catalog packed with specifications, ideas and suggestions, including recommendations for special applications. No charge, no obligation. Write today for catalog and name of nearest distributor.



Rapistan®

FASTEST GROWING NAME IN CASTERS

The RAPIDS-STANDARD CO., Inc., 89 Rapistan Bldg., Grand Rapids, Michigan
Circle No. 99 on Reader Service Card for more information

LETTERS
to the editors

Needs Light-Duty Elevator

To FLOW:

We are interested in a hydraulic platform elevator of approximately 4 x 5-foot platform area with a 10-foot high lift for use between cellar and first floor level.

Could you give us information on a low priced lift with about a 1500-pound maximum load.

Herman Hervitz
Hervitz Packing Company

We have referred Reader Hervitz to several manufacturers whose products are ideally suited to his requirements.

Inquiry From Belgium

To FLOW:

One of our customers, a wire-maker, has submitted the following problem.

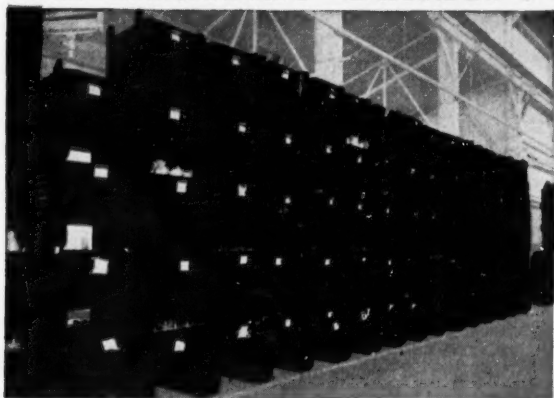
Our industrial trucks, which are equipped with rubber tires, tend to pick up pieces of scrap metal which frequently become scattered over our indoor traffic lanes. These scraps naturally cause damage to the tires.

Considerable labor is involved in clearing these aisles, hence we are seeking a faster and more economical method. Is there perhaps a magnetic device which could pick up these metal wastes and deposit them in a bin? We'd appreciate any information regarding possible manufacture, prices and delivery of such a product along with specifications.

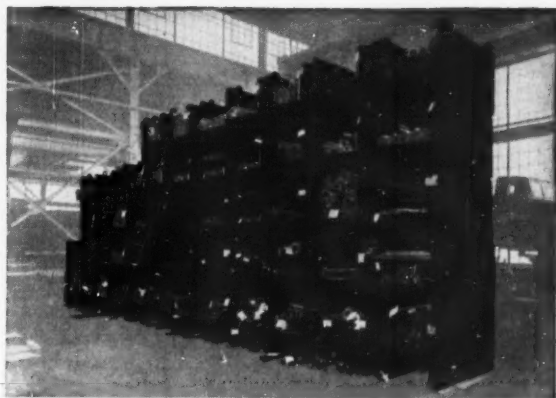
Direction Ventes
R. Kraft de la Saulx
Peetersco
S.P.R.L.
208 Rue De LaLoi
Bruxelles, Belgium

We've asked for advice on this request from experts in the field

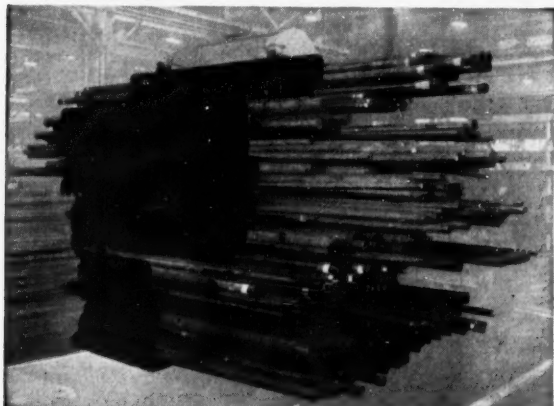
Here's How **POWELL** Job-Designed Handling Equipment Reduces Costs on Variety of Products for Machine Builder



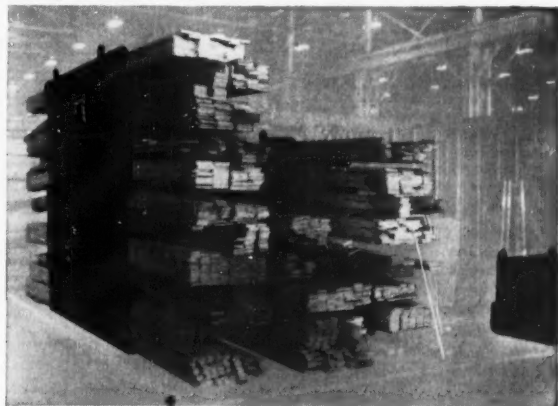
POWELL Standard Box Platforms permit uninterrupted production flow . . . eliminate inventory headaches and present neat, orderly stock control of small, odd-shaped parts.



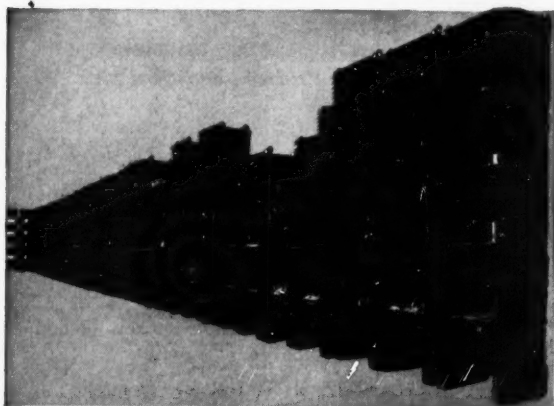
POWELL Open-End Rack Platforms permit instant identification for semi-finished and finished parts. Reinforced side entries allow ready lift truck handling for easy stacking.



POWELL Bar Carriers have long been standard equipment in plants where control of stock bars, rod, pipe, tubing, etc., is essential.



Hard to handle flats and beams, too, are contained in easy-to-get-to, orderly fashion by using the heavy-duty **POWELL Bar Carrier**.



POWELL complete painting facilities are designed especially for coating containers with tough, wear-resisting paint that makes **POWELL** all-steel equipment popular where outside storage is necessary.

One of the nation's leading road machine manufacturers is minimizing production costs by taking advantage of modern materials handling methods. Here's how it works. Each job is thoroughly surveyed; then, **POWELL** materials handling experts take over and recommend a container that exactly fits each job requirement. Here you see a few of the many types of these **POWELL** containers that have enabled this manufacturer to bring his cost far below the industry's average.

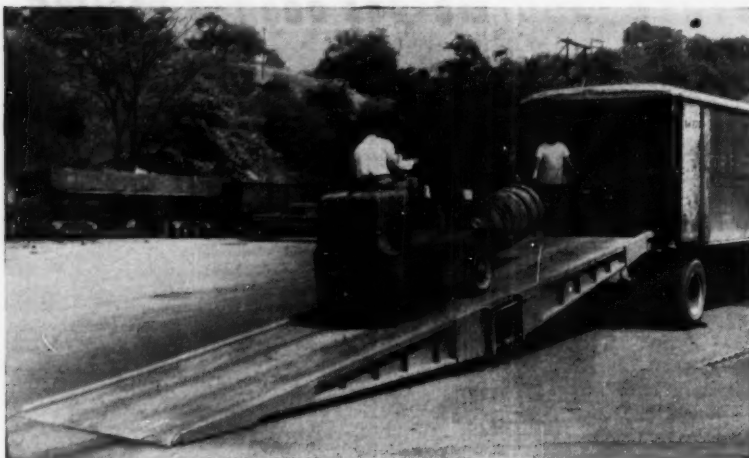
PRESSED METAL STAMPINGS—The engineering capacity, press facilities and die making equipment of Powell's Custom Stamping division are among the finest in the nation. Make a note now to call Powell the next time you're in the market for quality stampings.

THE POWELL PRESSED STEEL CO., HUBBARD, OHIO

Originators of All Steel Cold Formed Materials Handling Equipment
(in Greater Youngstown)



Circle No. 94 on Reader Service Card for more information



"Trailer-Loading Time Cut in Half... WITH OUR MAGCOA PORTABLE YARD RAMP"

— Reports Frank Gray, Traffic Manager, Universal-Cyclops Steel Corp., Bridgeville, Pa.

"We now load 400,000 lbs. of steel products in an 8-hour shift; have released two men for other duties—direct benefits of our MAGCOA Yard Ramp," says Mr. Gray.

Universal-Cyclops Steel Corporation was one of the first to cash in on the time-money-and-manpower savings possible with the revolutionary new MAGCOA Portable Magnesium Yard Ramp that permits truck-loading and car-loading from ground level.

Here's what you'll find when you look into the MAGCOA Yard Ramp—

- One man moves it.
- Hydraulic lift helps position it.
- You get fuller use of present facilities, lift trucks and operators.
- Bridge-type construction of rugged magnesium—by magnesium fabricating specialists.



Yard Ramp features one-man positioning

- Capacities to 16,000 lbs. in five standard sizes.
- Exclusive MAGCOA quarter-round safety curbs and rounded end-castings protect workers, lift trucks and loads.
- Low cost—less than conventional stationary docks in most of U. S.
- Prompt delivery from mass-production factory.
- Enthusiastic users from Coast to Coast.

Look into all the facts! Send for literature showing how the new MAGCOA Portable Yard Ramp can speed ground-level loading for you.

At the same time, look into how MAGCOA light-weight, heavy-duty Magnesium Dockboards can speed your dock-level loading.

Use the handy coupon.



Magcoa Yard Ramps speed car-loading, too

MAGNESIUM COMPANY OF AMERICA

MATERIALS HANDLING DIV., EAST CHICAGO 1, IND. — Representatives in Principal Cities

DIVISION OFFICES:

NEW YORK 20,
30 Rockefeller Plaza
PHILADELPHIA 18,
8001 Southampton Ave.
WASHINGTON 5, D. C.
Walker Bldg.
HOUSTON 17,
7657 Mainline St.
LOS ANGELES 34,
8922 W. 25th St.
SAN FRANCISCO 4,
Russ Bldg.

Please send ☐ Yard Ramp Literature ☐ Dockboard Facts 1

Name & Title _____

Company _____

Address _____

City—Zone—State _____

Circle No. 73 on Reader Service Card for more information

LETTERS

Continued

of electronics. Perhaps there are others among our readers who have been confronted with this problem and found a suitable solution.

Material Handling Films

To FLOW:

We are currently trying to set up a visual aides program for the information and guidance of supervisory personnel in all fields of production, manufacturing, material handling and packaging. Perhaps you can advise us as to which companies have movie film to lend and the subjects covered. Irwin Zacharin
Federal Mfg. & Engineering Corp.

To Reader Zacharin and others desiring films on material handling we at FLOW strongly recommend sending a request to the Material Handling Institute, Inc., 813 Clark Bldg., Pittsburgh 22, Pa., for a copy of its catalog of films. Numerous manufacturers of material handling equipment have available films listed in that catalog.

Interested In Story On Pneumatic Conveyors

To FLOW:

We are interested in obtaining more information on pneumatic conveyors which you briefly describe on page 13 of your October issue.

Could we have the names of some of the manufacturers of this type conveyor.

Fred H. Kniehl
The Carwin Co.

This inquiry from Reader Kniehl has been passed on to the manufacturers and complete details should be forthcoming promptly.

MATERIALS-HANDLING NEWS

★ Panel Discussions by Bassick, World's Largest Manufacturer of Casters and Floor Protection Equipment ★

Latest Bassick contributions to better handling at lower cost

Three new casters deliver smooth performance under load

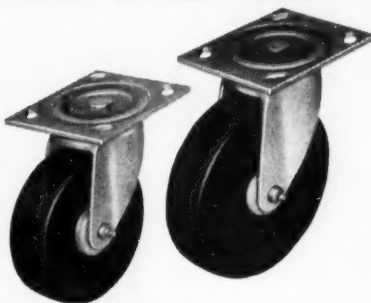


NEW "FORM-FORGED"
S99 Heavy-Duty Steel Caster

Structurally shaped of heavy-gauge steel, this rugged new caster handles loads up to 1500 lbs. It comes in 5", 6", 8" and 10" sizes, has double ball race with fully hardened raceways for long service. Forged, semi-steel or rubber tread wheels with 2½" tread width. Use it for tough jobs like powered assembly-line dollies, heavy trucks and equipment.

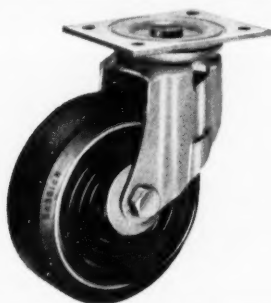
NEW "DIAMOND-ARROW"
H68 Light-Duty Truck Caster

Built to carry loads up to 350 lbs., these new 5" and 6" casters give you *double* ball bearing swivel action at a lower price than comparable casters with single ball bearing swivel. Roller bearing wheels with soft rubber or tough Atlasite solid composition treads, with thread guards.



NEW "FLOATING-HUB"

8" and 10" "Form Forged" Steel Casters



Bassick's famous "Floating-Hub" design in two new sizes for loads up to 1000 lbs. per caster. Built for general duty, these shock-absorbing steel casters furnish utmost protection against shocks caused by bumpy floors. Less wear on trucks because wheels absorb bumps — less wear on floor because the caster takes the impact.

Check your Bassick distributor for details

The answer to your caster or floor protection problem is no farther away than your telephone. Use it to find out from your Bassick industrial distributor how Bassick equipment can help you move materials

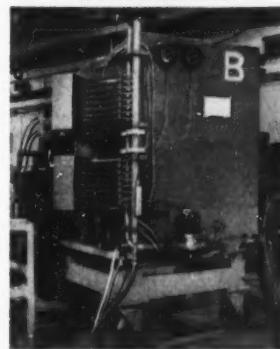
faster, at lower cost. He'll be glad to give you specific recommendations for putting the new Bassick developments described above to work in your plant.



This Groove Simplifies Many Materials-Handling Problems

If you're moving loads often in the same direction, Bassick casters with "V" grooved wheels can do it easier and more economically. Casters roll on inverted angle iron track — make movement 3 times easier than with flat wheels in direct contact with floor. Track is easily installed, inexpensive, and self-cleaning. Bassick grooved-wheel casters are made in 4", 6", 8" and 10" sizes, swivel and rigid.

How it Works at Brookhaven



Expensive apparatus is easily and safely positioned at Brookhaven National Laboratory, Upton, N. Y., by Bassick heavy-duty grooved wheel casters.



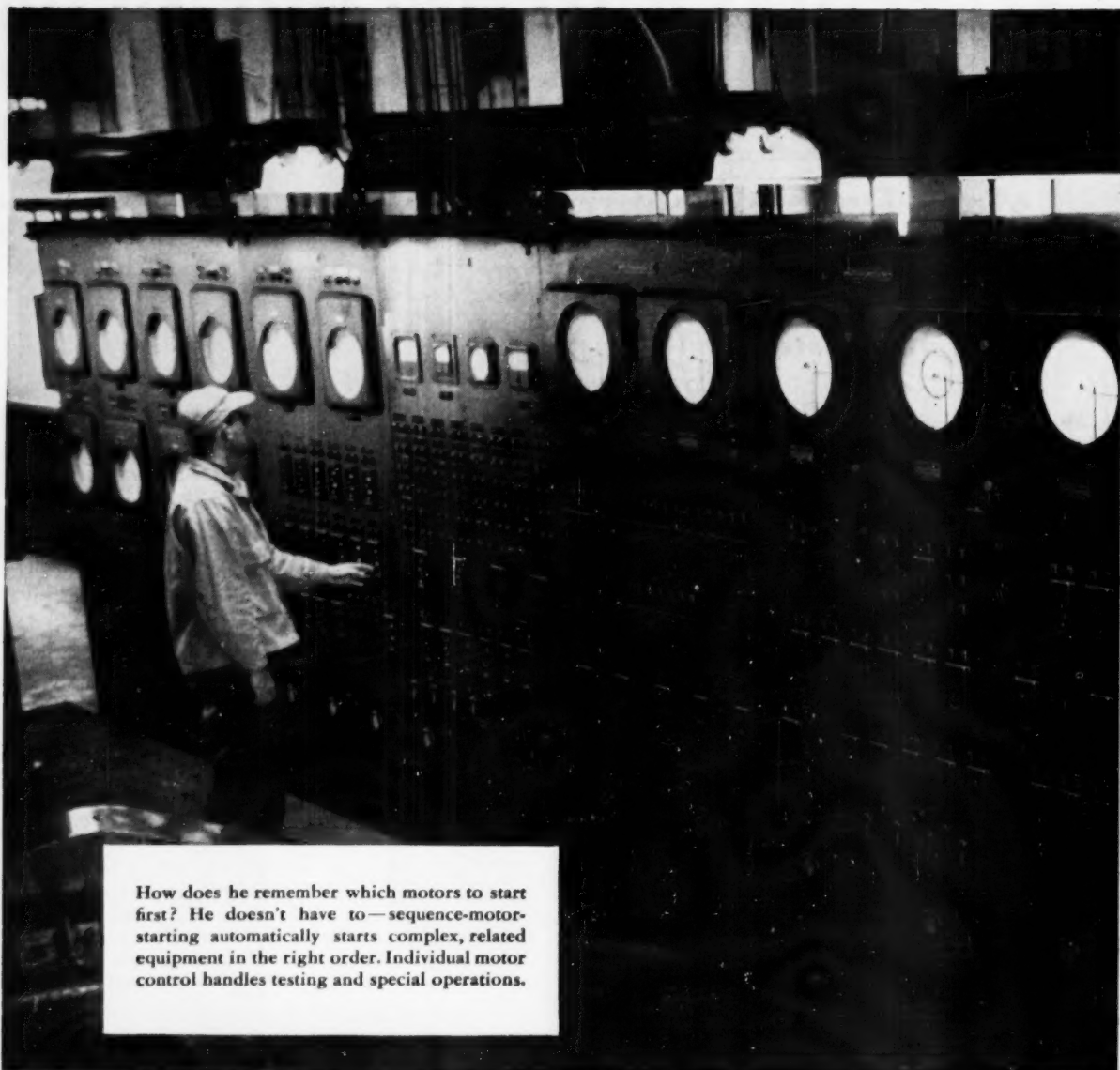
THE BASSICK
COMPANY
Bridgeport 2, Conn.

In Canada:
Belleville, Ont.



MAKING MORE KINDS OF CASTERS...MAKING CASTERS DO MORE

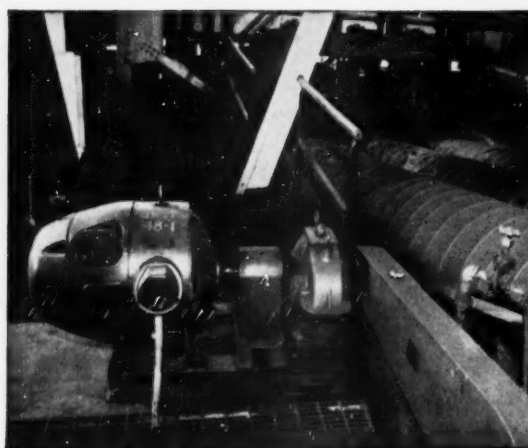
Circle No. 17 on Reader Service Card for more information



How does he remember which motors to start first? He doesn't have to—sequence-motor-starting automatically starts complex, related equipment in the right order. Individual motor control handles testing and special operations.



Variable-speed motor, built by Westinghouse, drives raw coal feeders at a constant rate of 20 lbs. per foot.



Westinghouse motor drives Atkins medium spiral densifiers at Robena. These carry damp coal up into chutes.

Does this automatic, 1-man operation give you any materials handling ideas?

At Robena, Pennsylvania, in one of the world's largest and newest coal cleaning plants, chances are you'll find ideas to improve any materials handling setup.

Westinghouse was on the team

Each hour this efficient plant turns out 650 tons of high-grade metallurgical coal, free of rock, slate and other foreign matter. Its owner, U. S. Steel Company, and their cleaning plant designer, McNally-Pittsburgh Manufacturing Corporation, did a top-flight engineering job. Westinghouse supplied practically all the electrical equipment.

One man, many buttons

The main idea behind this outstanding operation is automatic, centralized control. One man presses a few buttons and processing machines start automatically, in just the right order. There's no time lost by men following check charts and running all over the plant. This reduces the chance of human error and, more important, it boosts output per man-hour.

Siren sounds pile-up warning

Once under way, plant operation is kept safe and smooth by additional electrical controls. If a piece of equipment becomes overloaded, a siren sounds to inform the operator. If the overload persists, coal feed to the unit is automatically stopped to prevent pile-ups. If the unit still remains overloaded, it automatically shuts down to avoid damage.

Next time call Westinghouse

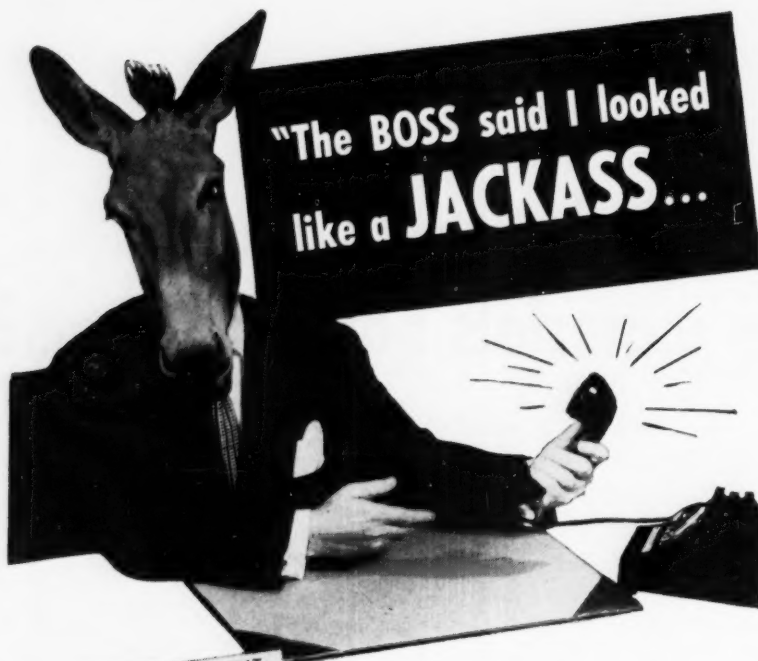
A bulk-handling operation like this cuts labor costs, protects equipment, and reduces the amount of usable product reaching the refuse pile. Automatic electrical control and first-rate equipment engineering make the difference. Westinghouse, experienced in all industries, can contribute both to your next materials handling project. Call your nearby Westinghouse office early in the planning stage. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania.

J-94986

YOU CAN BE SURE...IF IT'S
Westinghouse



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PURCHASING AGENT

... for **NOT** buying those **TOUGHER** *Buffalo* **Conveyor BELTS**"

"The boss just called from down on the production floor where one of those 'bargain' belts I bought this year has 'pooched out' right along side of a Buffalo Belt we installed three years ago."

They're made TOUGHER! Buffalo Conveyor Belts are made from the toughest cotton yarn available on the market. *They're woven TIGHTER* by our exclusive *Wov-In-Wear* weaving process on our own specially-designed looms. *They last LONGER!* Tougher yarns and tighter weaving naturally mean longer life for any Conveyor Belt. However, you never pay a premium for any Buffalo Conveyor Belt... just the regular established price! Yet users tell us they last years longer. Ask your mill supply man to show you the difference!



**OVER
200 SIZES
35 WIDTHS
7 THICKNESSES**

**For instance in the
CANNING FIELD**

we feature LATEX

Impregnated with oil resistant latex, this belt is ideal for canneries, food storage plants and machine assembly lines. Resistant to water, acids, grease and heat. White or maroon colors, this odorless, very pliable, high-tensile belt has the wear resistance that has made it a favorite with economy minded buyers everywhere.

**Write for
FREE FOLDER**

14 pages of sizes, types and prices



BUFFALO WEAVING & BELTING COMPANY

209 CHANDLER STREET

BUFFALO 7, NEW YORK

NEW YORK PHILADELPHIA CHICAGO DETROIT LOS ANGELES

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association and society NEWS

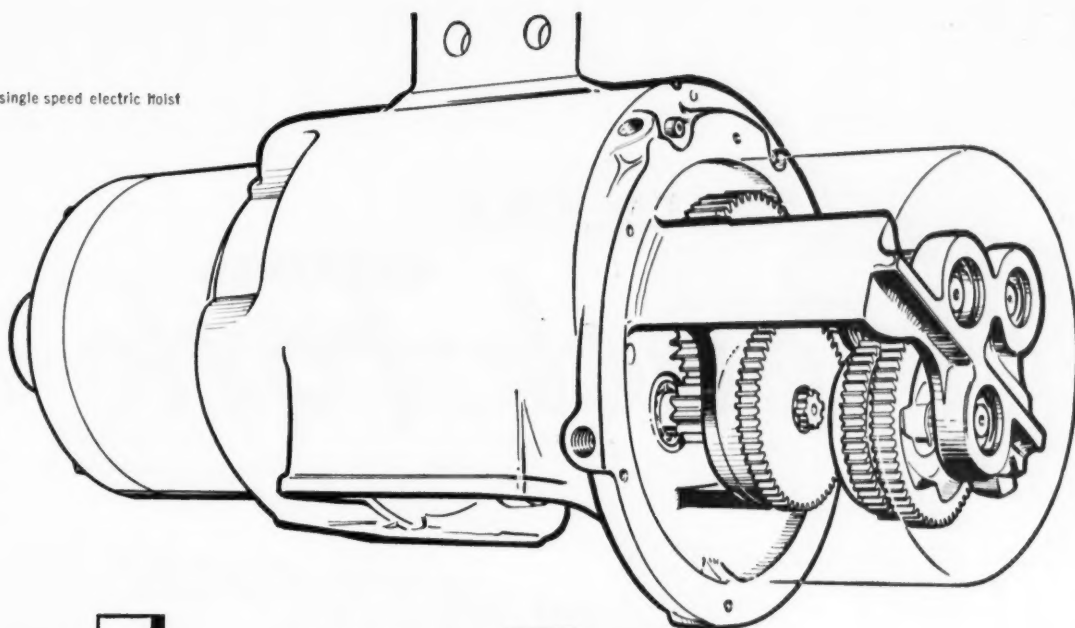
● **James S. Hanson** (The Fairbanks Company) has been elected President of the Caster and Floor Truck Manufacturers' Association for the ensuing year. K. F. Heath (Nutting Truck & Caster Co.) is the new Vice President. The Association's annual elections were held in Cleveland on October, 15. C. H. Strauss (Ironbound Box & Lumber Co.), Past President, was named a Director for a one year term, as was W. C. Shea (The Colson Corporation), who fills the vacancy created by Hanson's election to the presidency. Directors elected for three-year terms are E. L. Lee (Saginaw Products Corp.) and C. M. Mead (Divine Brothers Co.).

● **Members of the Falls Cities Chapter** of the American Material Handling Society have scheduled a plant tour for their Dec. 17th meeting. The General Electric Co. kitchen range and water heater department at Appliance Park, Ky., will be visited by the group.

● **With no December meeting scheduled**, the Detroit Material Handling Section of the American Society of Mechanical Engineers is looking forward to the program planned for Jan. 5th. A speaker from the Michigan Limestone Division will address the group on "Bulk Handling at the Mines and on Modern Lake Freighters."

● **New officers** recently installed by the Indianapolis Chapter of the Society of Industrial Packaging and Material Handling Engineers in-

Type "J" single speed electric Hoist



plenty

of everything to spare

STRENGTH TO SPARE—Robbins & Myers "J" Hoists are loaded with strength—extra strength in the frame, in the shafts and gears, in the cable and hook. They are built to lift your loads . . . today, tomorrow, and for years.

POWER TO SPARE—Special Robbins & Myers hoist motors, rated conservatively with ample reserve for overloads, make "J" Hoists integrated units. One maker responsibility guarantees matched parts of higher quality without question.

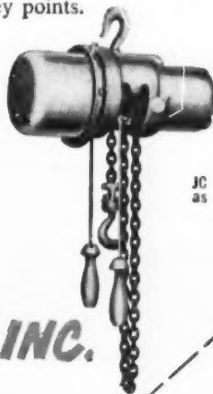
SAFETY TO SPARE—Twin safeguards—an oversized shoe brake on the motor and a Weston-type load brake

with non-reversing clutch—give instant control over the load. Flanges and a limit switch keep the cable and hook from over-riding the drum.

PRECISION TO SPARE—Close tolerances . . . long life bearings . . . perfect sealed lubrication . . . have been liberally engineered into "J" Hoists. They give you most hoist and hoistwork per dollar invested.

(R & M "JC" electric chain hoists, give the most hoist per dollar and *at the lowest price today*. Single and double chain reeving—capacities from 500 to 2,000 lbs.) Stocks available at key points.

Load Capacities	500 to 4,000 lbs.
Headroom required	20" to 31"
Speeds	15-30 f.p.m. for 220-440-550V 3-phase 60 cycle, or 110-220V single-phase.
Suspension	Lug, hook, push, hand-gear, and motorized trolleys.



JC prices start
as low as \$188.00.

TAKE IT UP WITH

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO

BRANTFORD, ONT.



FANS



MOTOR PUMPS



HOISTS | CRANES



MOTORS & GENERATORS



FANS

clip
staple to letterhead
add name & title

Please have representative call ☐

Please send J hoist bulletin No. 451 ☐

Please send JC hoist bulletin No. 852 ☐

FLOW

Circle No. 105 on Reader Service Card for more information

MAKES 6-FT. AISLES PRACTICAL

RAYMOND

Reach-Fork*

TRADE MARK

NO NEED FOR SPECIAL RACKS OR PALLETS
USE YOUR EXISTING EQUIPMENT

GAIN UP TO 50%
MORE STORAGE

- It's here . . . the day you can install 6 ft. aisles without antiquating your present racks or pallets. Only the Raymond REACH-FORK enables you to use existing warehouse equipment because only the REACH-FORK has "boarding house reach". With this great new electric truck, you double your storage capacity simply by reducing the width of your aisles.

● SEND FOR BULLETIN

The RAYMOND CORPORATION

3322 Madison St., Greene, N.Y.

() Please send me a REACH-FORK Bulletin.

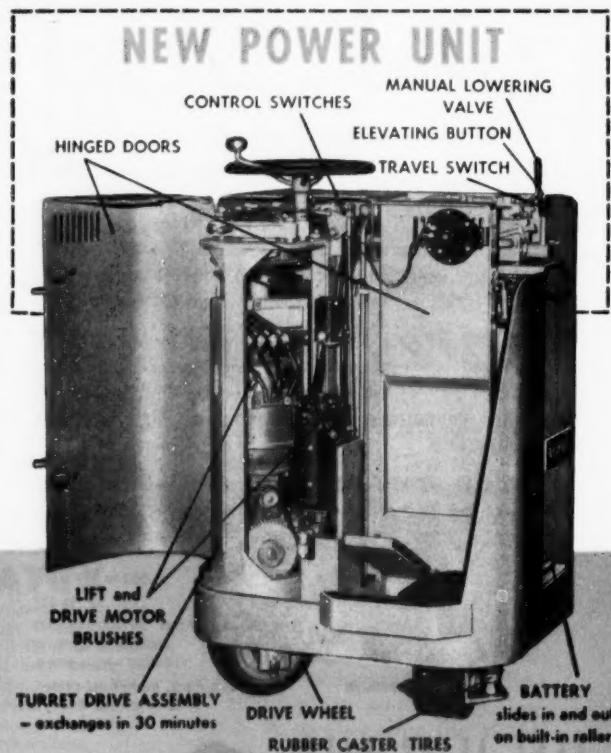
() Please have your representative call.

NAME _____ TITLE _____

COMPANY _____

STREET _____

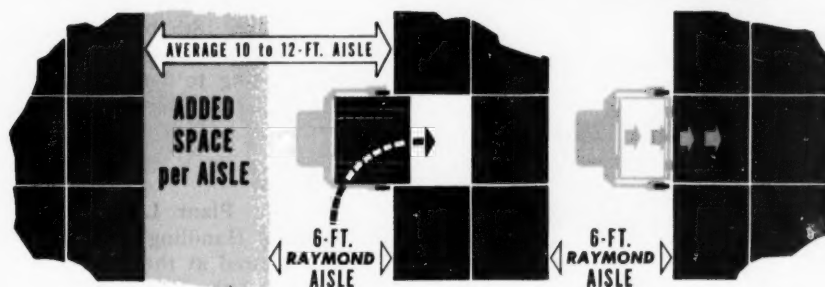
CITY _____ STATE _____



REACH-FORK Power Unit opens up like a book for fast, easy servicing. All parts are housed behind hinged double doors . . . nothing under the unit to inspect or service except the wheels. New Power Unit provides maximum operation with a minimum of downtime . . . plus greater rider comfort and safety.

IN YOUR WAREHOUSE...NOW!

LOOK WHAT THE REACH-FORK DOES



- Gives you up to 50% more storage by right-angle tiering from 6 ft. aisles.
- Handles any size pallet . . . operates with any rack setup.
- Stacks pallets closely . . . ideal for truck trailer, boxcar, rack storage use.
- Weighs less than conventional tiering trucks . . . use it on low-capacity elevators, floors.
- Reaches right out to pick up . . . or deposit your load . . . forks extend 24" and back in seconds.
- Features 41" free lift for elevating loads in low-ceiling areas, truck trailers, boxcars.
- Cradles your load when traveling . . . forks have automatic 5° tilt.

MODEL E2RT

Capacity: 2,000 lbs.



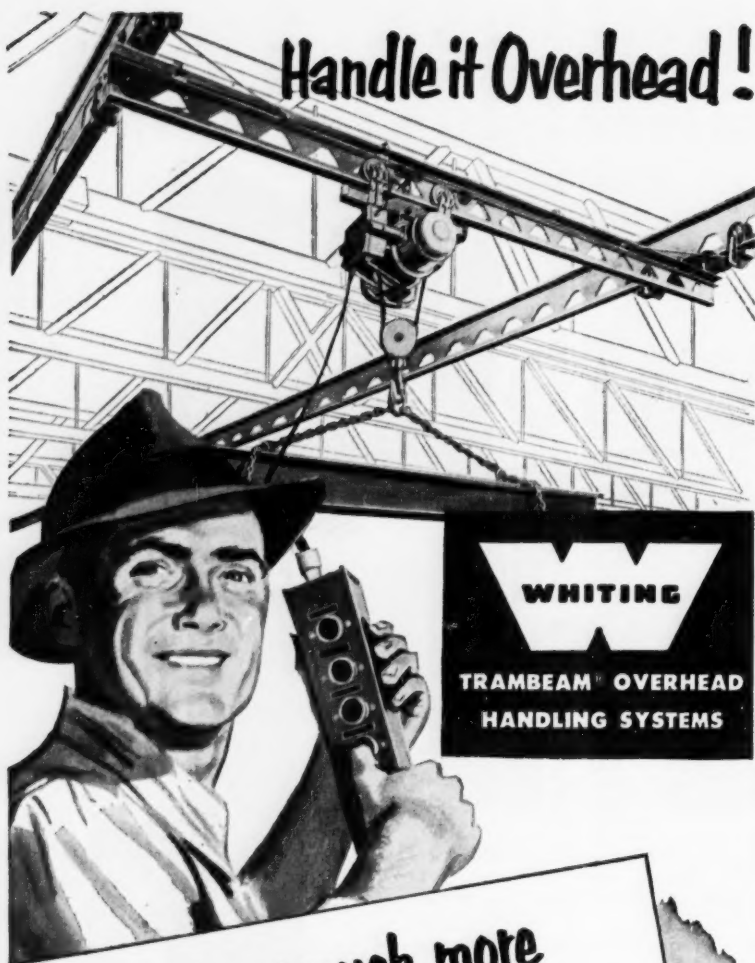
ELECTRIC INDUSTRIAL TRUCKS

HYDRAULIC ELEVATING EQUIPMENT

*PATENT NO. 2,564,002

DON'T DELAY a single day! Learn how the Raymond REACH-FORK can make tremendous space-savings right in your own warehouse. Mail the coupon now.

Circle No. 100 on Reader Service Card for more information



Handle it Overhead!

WHITING
TRAMBEAM® OVERHEAD
HANDLING SYSTEMS

See how much more **WHITING** offers!

- ✓ **Increased Plant Capacity**—Whiting's multi-industry experience can help you get all the benefits of overhead handling. Whiting Trambeam makes building investment cost less . . . gives you more room for production, storage, assembly and shipping!
- ✓ **Lower Costs**—Whiting Trambeam is "tailor-made" for you from standard components. Use it alone or use it with other handling equipment.
- ✓ **Flexibility**—Crane or monorail—or both! Whether you want fast point-to-point transport or complete area coverage, Whiting Trambeam provides the important advantage of flexibility!

Other Whiting materials handling equipment:
Overhead Cranes • The Trackmobile • Electric Chain Hoists

WHITING CORPORATION
15659 Lathrop Avenue, Harvey, Illinois

Send for this Folder!

See how Trambeam speeds work in six departments of the Euclid, Ohio plant of Reliance Electric and Engineering Company!

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ASSOCIATIONS

Continued

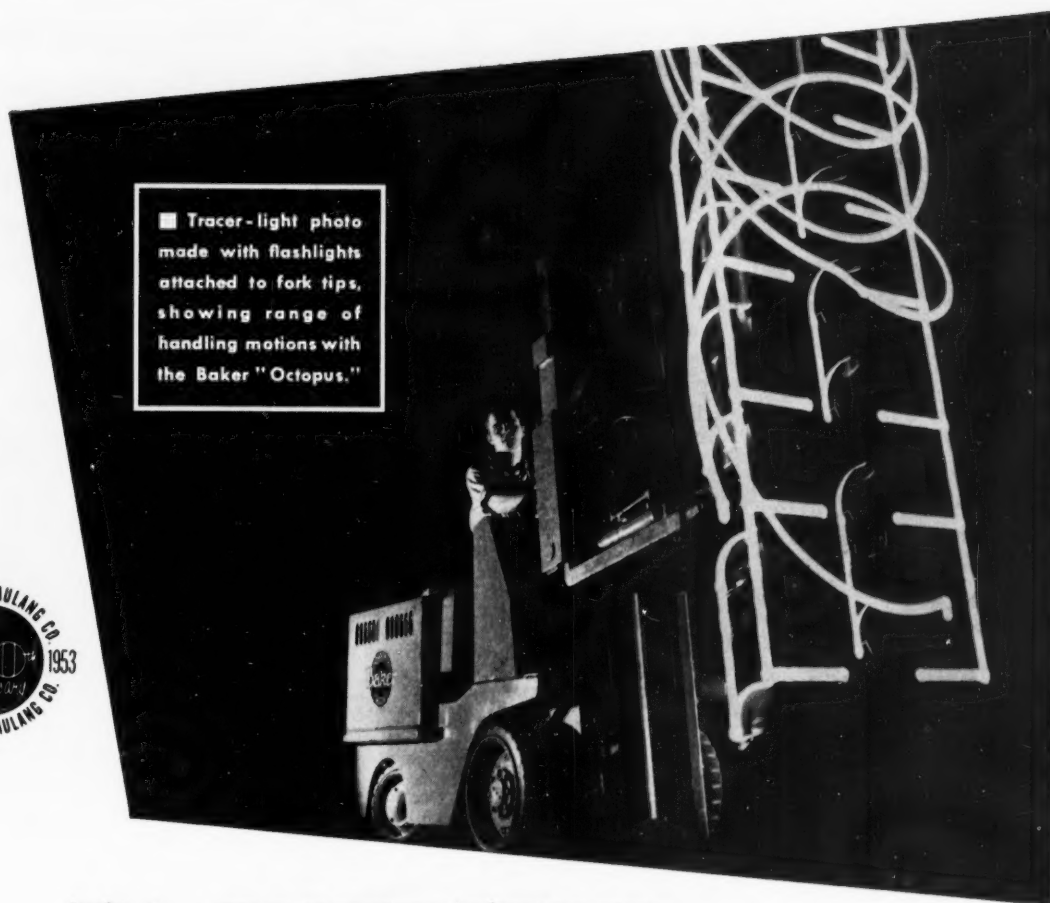
clude the following: Conrad L. Short, traffic manager and assistant general manager of the Ellis Trucking Co., president; Wilbur M. Cordell, American Kitchen Co., vice president; Ralph Coffman, traffic manager of the Indiana Farm Bureau Co-op Ass'n, treasurer; Richard E. Lenhard, sales representative for Signode Steel Strapping Co., secretary.

● **Ladies' Night** has been planned for Dec. 18th by the Philadelphia Chapter of the AMHS, according to a report by Charles F. Gross, secretary-treasurer.

● **"Integrating Plant Layout With Material Handling"** will be the topic aired at the Dec. 17th meeting of the Cleveland Chapter of the AMHS. Speakers will be top-flight engineers from Reliance Electric Co. of Cleveland and Homer Dasey, president of Visual Plant Layouts, Inc., Pittsburgh.

● **R. M. L. Francis**, managing director of National Adhesives Ltd., has been elected president of the newly formed Adhesives Manufacturers Association of England. He is well-known in European industrial circles as he has been managing director of the National Starch Products Inc. subsidiary for the past 23 years.

● **At their recent 21st annual meeting** of the Packaging Machinery Manufacturers Institute elected officers for the current year. President is Robert T. Forman, of R. A. Jones & Co.; vice president is Mrs. Helen Horix Fairbanks, president of the Horix Mfg. Co.; and vice president is Tom Miller, vice president of the Package Machinery Co.



This BAKER TRUCK handles any shape load ... *and stacks it in any position!*

■ You name the load—the Baker "Octopus" illustrated will handle it, whether it's a drum, a roll of newsprint, a packing case, a piece of machinery, a bale of cotton or a pallet load of cartons. Moreover, it will pick it up, transport it, raise or lower it, shift it to left or right, revolve it, up-end it, or stack it in any position. In fact, it will handle it with no more physical effort than is needed to operate the simple hydraulic controls.

The "Octopus" consists of a standard Baker Fork Truck equipped with a variety of Baker attachments—360° revolving head, 4-purpose carriage, up-ender, drum clamp, etc.—which may be applied individually or in combinations. While one truck may never be called on to perform all these functions, the "Octopus" demonstrates the range of utility of Baker fork trucks and attachments.

Baker

industrial trucks

write for

6-page special report on the application of Baker attachments to various loads.

THE BAKER-RAULANG COMPANY
1219 WEST 80th STREET • CLEVELAND 2, OHIO

BAKER-LULL Corporation, Subsidiary, Minneapolis, Minn.
Material Handling and Construction Equipment.

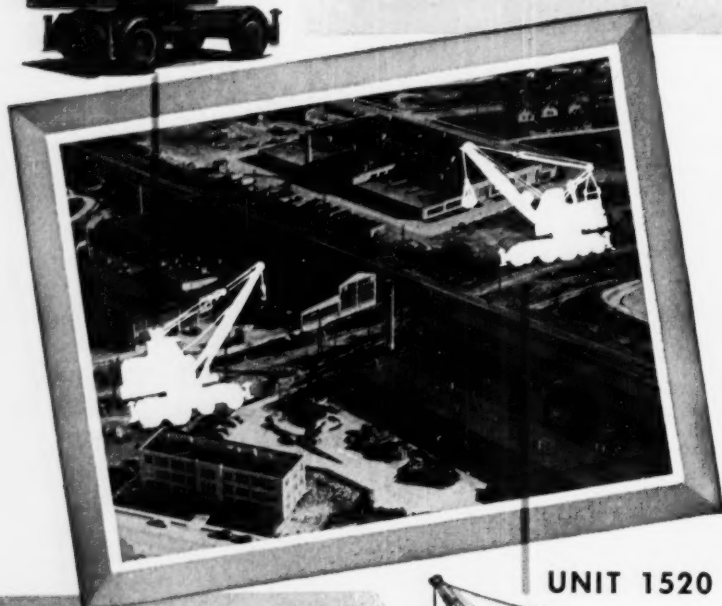
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UNIT 357



UNIT

Self-Propelled Mobile Crane



**Fits into Any
INDUSTRIAL
PICTURE!**



UNIT 1520

You'll find a UNIT Mobile Crane is just the machine you need for the many material handling jobs around your plant. It's self-propelled, rides on rubber, travels anywhere. It has 1001 uses, in and out of yard. Works efficiently even in small yards where space is limited. Controlled and operated by ONE man. Powered by ONE engine. Balanced weight distribution in upper structure adds full-length stability to undercarriage. Provides full-circle, fast-cycle operation. Easy hydraulic steering. Streamlined, FULL-VISION Cab gives operator complete visibility in ALL directions. Promotes safety. Investigate these Mobile Units!

UNIT 357 — Versatile, compact, lightweight Mobile Crane, ideal for your yard lifting and loading jobs. The smoothest operating and easiest handling crane on the market. Mounted on 6 pneumatic tires, duals on rear. Capacity 10 tons. Ask for Catalog L-301.

UNIT 1520 — Heavy-duty, self-propelled Mobile Crane — another UNIT advancement in modern, high-speed, rubber-tired equipment. Lifting capacity up to 20 tons. Mounted on 12 pneumatic tires, with duals on steering axle and tandem rear axles. Ample power for the toughest jobs. Ask for Catalog 502.

UNIT CRANE & SHOVEL CORP., 6531 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Crawler and Mobile
models — 1/2 and 3/4 Yd.
Excavators. Cranes up to
20 tons capacity.



SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHERS • MAGNETS

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MEN
in the news

... at The Bassick Co.

Richard J. Benson has been appointed advertising manager according to a recent announcement by the company. He has been with the company eight years, formerly handling government sales



R. J. Benson

and supervising the preparation of Bassick catalogs and sales literature. He also is co-chairman of the caster standards committee of the Caster and Floor Truck Association.

... at Electric Storage Battery Co.

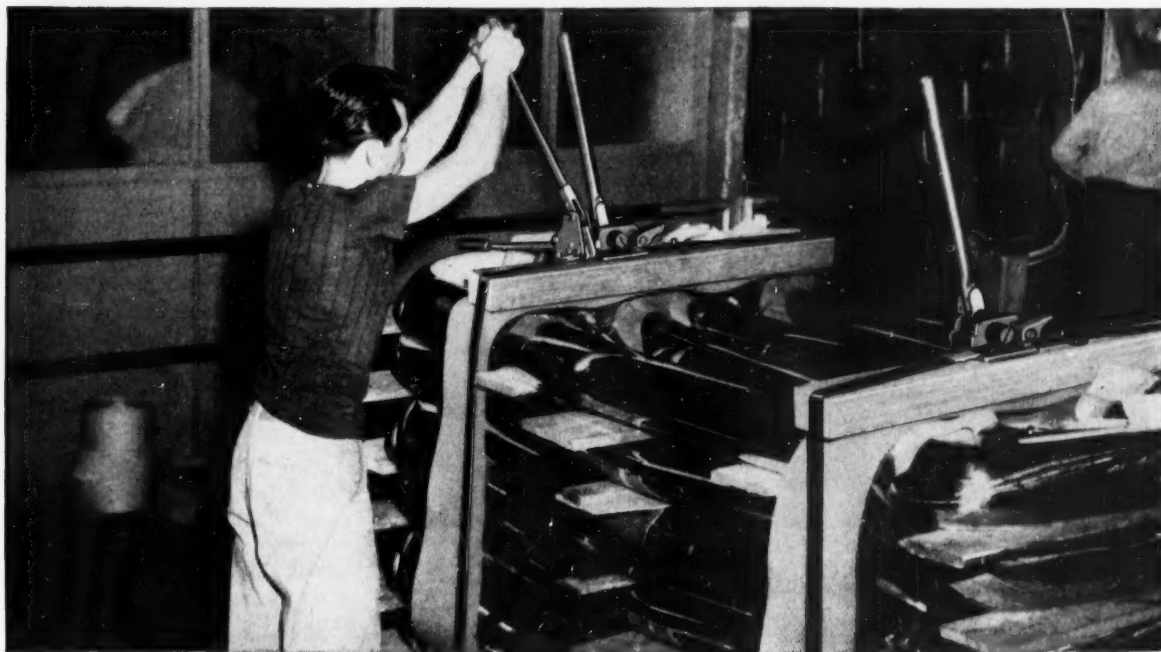
Supplementing his duties as vice president and director, Roland Whitehurst has been appointed general manager of the industrial products division. According to S. Wyman Rolph, president, the appointment completes the separation of the company operations into two divisions—industrial products and automotive products. Whitehurst has been with Exide since 1908 when he started as an office boy.

... at Acme Steel Co.

W. F. Hinkle, director of engineering and research, has announced two appointments at the company's Riverdale, Illinois, plant. Stephen Rasul has been named manager of design and production engineering, while John H. Harper has been named chief staff engineer. Rasul has been with Acme 35 years in various en-

Acme Steel Strapping Insures S.A. *(Safe Arrival)*

Saves time and trouble palletizing automobile bumpers



BUMPER-TO-BUMPER. Each multi-bumper unit is securely bound with Acme Steel Strapping, all ready to be moved by fork lift truck.

Shipping hundreds of awkward-to-pack, hard-to-handle automobile bumpers to auto assembly plants presents no problem to United States Spring & Bumper Co., Los Angeles. They quickly fasten each pallet-load of bumpers together securely with Acme Steel Strapping, making large easily-handled units.

This makes individual wrapping and loading unnecessary. And it takes only a matter of minutes to strap these bumpers onto pallets.

Acme Steel Strapping saves time, money and weight, protects each pallet-load from damage and insures S. A. (Safe Arrival).

Whatever packaging problems you may have in your plant, chances are that Acme Steel Strapping or Acme Steel Stitching can solve them. Ask your Acme Steel representative. Or write to Acme Steel Products Division, Dept. FM123, Acme Steel Company, 2840 Archer Ave., Chicago 8, Illinois.



STRAP IT... STITCH IT... SHIP IT... SAFELY!

**ACME
STEEL**

Circle No. 2 on Reader Service Card for more information

ALVEY Conveyors

In The Warehouse

Save Handling Time

**Both IN
and OUT**



Every time you MANhandle a package you add to the cost of your product, and nothing to its value. Therefore, it will pay you to let Alvey Engineers show you how direct savings can be made in your plant.

You are sure to benefit from the experience which qualified Alvey Engineers can offer you. Write or phone for an appointment.

ALVEY CONVEYOR MFG. CO.
9299 Olive Street Road, St. Louis 24, Missouri

BRANCH OFFICES IN PRINCIPAL CITIES

ALVEY

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MEN IN THE NEWS

Continued

gineering capacities. Harper joined the firm in 1948 as assistant chief engineer in the machine design engineering department.

... at Clark Equipment Co.

The appointment of **Clarence E. Killebrew** as manager of marketing and sales for the construction machinery division, has been announced by **George Spatta**, president. Killebrew joined Clark late last year after a 12-year association with the Frank G. Hough Co. where he was general sales manager at the time of his departure. In his new post he will be responsible for the sales and marketing of equipment manufactured for bulk handling of materials in the construction industry.



C. E. Killebrew

... at Colt's Mfg. Co.

B. Franklin Conner, company president, announced recently the appointment of **Alton K. Marsters** as director of sales for all divisions. He recently joined the company as assistant to the president. As director of sales Marsters will be responsible for all domestic and export sales and advertising for the company's products.

... at United States Rubber Co.

Clifford H. Shirley has been appointed to the newly created position of advertising manager of the tire division, according to **Wilson O. Green**, general sales manager for the division. He has been advertising and sales promotion manager for U. S. Tires since 1950, and before that had been assistant advertising manager.

FLOW • DECEMBER, 1953



How To Make More Money

Tuesday, October 21, 1952 THE MIAMI HERALD 21-A

Financial News

Winn & Lovett's Earnings On Rise

By United Press

JACKSONVILLE—Winn & Lovett Grocery Co. reported for the quarter ended Sept. 20 sharply higher earnings, reflecting economies achieved through mechanization in warehousing and merchandise handling.

Net for the first quarter of the current fiscal year, totaled \$600,597, or 44 cents a share on common, compared with \$409,342 or 29 cents in the same quarter last year. Net sales of \$41,851,672 compared with \$36,763,499.

As of Sept. 20, the food chain had in operation 181 retail outlets

THIS NEWS CLIPPING suggests one way to make more money. Winn & Lovett's "sharply higher earnings" prove that a dollar saved is *still* a dollar earned.

"Mechanization" saved more than 50% of Winn & Lovett's handling bill. "Mechanization" in this case means a fleet of CLARK fork trucks and towing tractors, operated on a well-planned schedule. These

savings, together with increased retail volume and retail operating improvements, resulted in "sharply higher earnings," and the company made financial headlines.

The moral of this story is this:

Call in your local CLARK dealer to discuss ways to cut handling costs. That's what Winn & Lovett did, and look what happened!



Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 13, Michigan

Circle No. 32 on Reader Service Card for more information

NEWS VIEWS TRENDS

LAMSON BUYS MOBILIFT

Lamson Corporation has acquired the fork truck business of Mobilift Corporation of Portland, Oregon, as of November first. A new Oregon subsidiary, Lamson Mobilift Corporation, takes title to the assets being purchased and will carry on this fifteen-year-old business as an integral part of the Lamson line of material handling equipment. Mobilift assets purchased include all equipment, machinery and inventory at manufacturing plants in Portland and at five sales, service and parts branches at Berkeley, Calif., Dallas, Tex., Chicago, Ill., Atlanta, Ga., and Rutherford, N. J. The Mobilift dealer organization and sales force located at industrial centers throughout the country will be continued.

LEWIS-SHEPARD ENTERTAINS

A highspot of the week of the Eighth National Industrial Packaging and Material Handling Exposition was a tour of the plant of Lewis-Shepard Co., Watertown, Mass. Visitors to the exposition were invited to go through the industrial truck manufacturer's factory to see first-hand, the high degree of accuracy and care which today's material handling equipment demands. Guides gave thorough explanations of each operation in the plant. After the tour, a demonstration was given of different types of equipment in actual operation.

PALMER-SHILE ADDS NEW BUILDING


Expansion at the Palmer-Shile Co. in Detroit is getting to be an annual affair. For the third time in as many years the company has added to its manufacturing capacity. This year a new building known as Plant No. 4, has given the firm another 15,000 square feet of floor space. New equipment to handle the increased production also is being purchased. Palmer-Shile began manufacturing its wide line of material handling equipment in 1917.

ANNOUNCE PLANT- MAINTENANCE SHOW

Fifty-nine conference sessions are being lined up on the program for the annual Plant Maintenance and Engineering Conference and show to be held in Chicago January 25-27. Conference sessions are to be divided into three general sessions, 16 sectional conferences and 40 round table discussions. They will all be conducted at the Hotel Conrad Hilton. More than 350 exhibitors are expected to display products and conduct demonstrations for an anticipated crowd of 20,000 visitors in the International Amphitheatre. Both events, now in their fifth year, are produced by Clapp & Poliak, Inc., and in the short period have risen among the five largest annual industrial expositions.

REYNOLDS ALUMINUM ON DISPLAY TOUR

A gleaming ultra-modern aluminum trailer has set out on a tour of the nation from the Reynolds Metals Co. plant in Louisville, Ky. Called the "Packaging Bandwagon," the trailer crew will conduct demonstrations of the newest applications of aluminum in the packaging field. In addition to built-in movie and slide projectors there are illuminated wall displays showing 160 aluminum foil packages now in use by manufacturers of varied products. Arrangements to visit any specific location may be made by writing to the company's packaging division, 2500 South Third Street, in Louisville.

Circle No. 85 on Reader Service Card 
FLOW • DECEMBER, 1953



EVERY YEAR
more and more
people order
more and more
MONARCHS
for Replacements*

*Every year, Monarch increases its manufacturing facilities for production of solid industrial tires. In 10 years, those facilities have been expanded 518% to keep up with the demand for solid tires. Since Monarch specializes in solid tires exclusively, you will find most lift truck manufacturers demonstrate their confidence in our experience by equipping their trucks with Monarch Solid Industrial Tires.

When you need new tires for your truck, call in your Lift Truck Dealer. He knows trucks best and he knows the type Monarch tire best suited for your operation.

Monarch Efficiency Tires
for Electric Trucks. Monarch General Purpose
for Gas Trucks or where
extremely severe conditions call
for a tough tire.



**THE
MONARCH**

RUBBER COMPANY

550 LINCOLN PARK • HARTVILLE, OHIO
7-255 GENERAL MOTORS BLDG., DETROIT 2, MICH.

SPECIALISTS IN INDUSTRIAL SOLID TIRES AND MOLDED MECHANICAL RUBBER GOODS

DOEPKE EXPANDS RESEARCH FACILITIES

A new research and engineering building has been completed at the Chas. Wm. Doepke Mfg. Co. completing a new phase in the development and improvement of the company's diversified line of products. Ott Moehringer, for 10 years chief engineer for the firm, will supervise a staff of five design engineers.

COLLEGES FOSTER PACKAGING SKILL

To meet the need for technical training in the field of packaging, our institutions of higher learning today are successfully bringing to individuals in industry who are responsible for packaging functions as much "know-how" as possible through the formation of specialized courses and symposiums. At Columbia and Purdue Universities, for example, exceptionally well-qualified speakers from industry have been enlisted to conduct lecture courses covering every phase of packaging technique. Columbia University's course consists of 21 lectures presented one evening a week over a 15-week period. Under the supervision of Prof. Frederick C. Winter, the course is open to the public as well as to students earning credits toward degrees. Purdue's course is of four-weeks duration and is being offered periodically throughout the year. Prof. M. I. Fowler is the course coordinator. Tuition for either course is nominal and companies engaged in extensive packaging operations are finding it much to their benefit to have their key packaging personnel absorb the wealth of ideas and information these schools and numerous others are able to assemble within their portals.

CARGO COORDINATION IS GROUP'S AIM

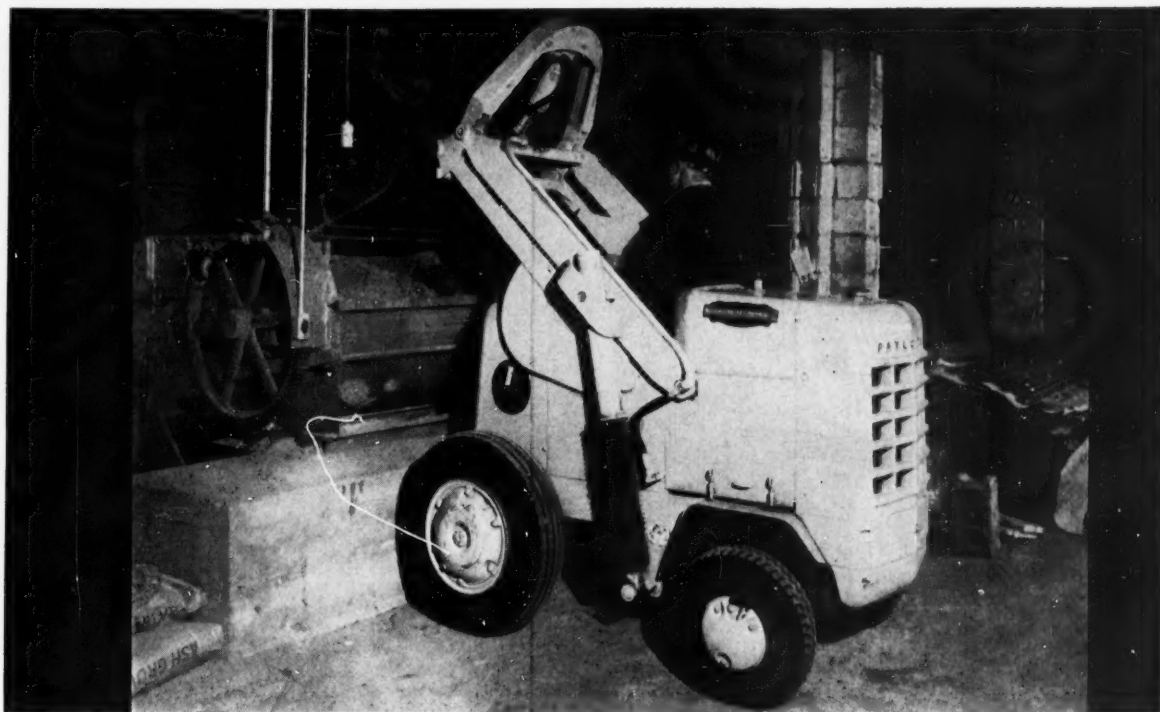
The two-year-old International Cargo Handling Coordination Association received American recognition recently with the formation of an American National Committee to join hands with similar committees in 23 other nations. The association was founded to disseminate information on problems related to the handling of ship cargo in order to speed up the turn-around of ships in port. A number of prominent U. S. firms already were members of the international organization. Most recent of the organization's activities was a symposium on palletization and unit load system held in London this past October. Next May another technical meeting and general assembly will be held in Naples, timed to coincide with the Italian maritime exhibition. Headquarters of the U. S. committee for the present are in the offices of Cargocaire Engineering Corp., 15 Park Row, New York City. Oliver D. Colvin, president of Cargocaire, was elected chairman of the new provision committee.

DOCK ACCEPTANCE WARRANTS EXPANSION

Increased sales demand for the HERCO loading dock has brought about a marked expansion program at the Karl A. Herman Co. A new building adding approximately 25 percent to its plant space was completed recently, and a similar increase in personnel is anticipated, according to Karl A. Herman, president.

NEW ENGLAND INDUSTRY SEEKS ECONOMY GROWTH

During its annual tour of regional plants, the New England Council this year visited the Thames River, Conn., plant of the Robert Gair Co. Inc. Eighty-five top executives of industries throughout New England showed particular interest in the research and laboratory facilities of the plant. Chief aim of the Council is to promote a new business economy in the New England area.



PAYLOADER *Changes losses to profits* **at Ideal Cement Stone Co.**

VALUABLE HANDBOOK

Tells how and where to look for signs of inefficient bulk materials handling . . . how to analyze, organize and set up an efficient handling system. Plus many useful tables and data. Write for "Bulk Materials Handbook" — it's free.



The making of sills and lintels was an unprofitable but necessary evil with this concrete block manufacturer until a "PAYLOADER" arrived on the job to take over the material handling part of the operation. Now, profits have replaced losses. The "PAYLOADER" picks up 1,000 lbs. of sand at a time from a stockpile, carries it 65 feet through narrow aisles and unloads it directly into the mixing machine. A second mixer has been added and the "PAYLOADER" operator runs both. Although fewer men are required, production is much greater and the manufacture of lintels, instead of being carried on at a loss, has become a profitable part of the business.

This is one of thousands of cases where "PAYLOADERS" have made tremendous economies in time, manhours and production costs, both inside and outside of plants — unloading box cars, digging, stockpiling, carrying, loading and spreading bulk materials. "PAYLOADERS" are available in a complete line of sizes and models up to 1½ cu. yd. capacity — a size for every plant and purpose. They are sold *and serviced* by 200 Hough Distributors nationwide. The Frank G. Hough Co., 731 Sunnyside Ave., Libertyville, Illinois.





Here's a One-Man Bulk Materials Handling System for Your Plant...

In the Dempster-Dumpster System of bulk materials handling only one man, the driver of the truck-mounted Dempster-Dumpster, is required for operation. The Dempster-Dumpster serves scores of detachable Dempster-Dumpster Containers. Container capacities range up to 4 times that of conventional dump truck bodies and each container

is designed to suit the materials to be handled—be they solids, liquids or dust . . . hot or cold . . . bulky, light or heavy. You simply place these containers at convenient materials accumulation points inside or outside buildings. When loaded each container is picked up, hauled and emptied (as shown above) or load set down intact. Entire op-

eration is handled by hydraulic controls in cab.

Containers shown below are just a few of the many available or that can be built to meet your needs. They enable you to handle, at tremendous savings, materials of many descriptions—trash and waste materials, raw materials, finished products, etc.—with only one truck and only one man, the driver.

Without question, the Dempster-Dumpster System is the most economical and most efficient method of plant materials handling by truck ever devised!

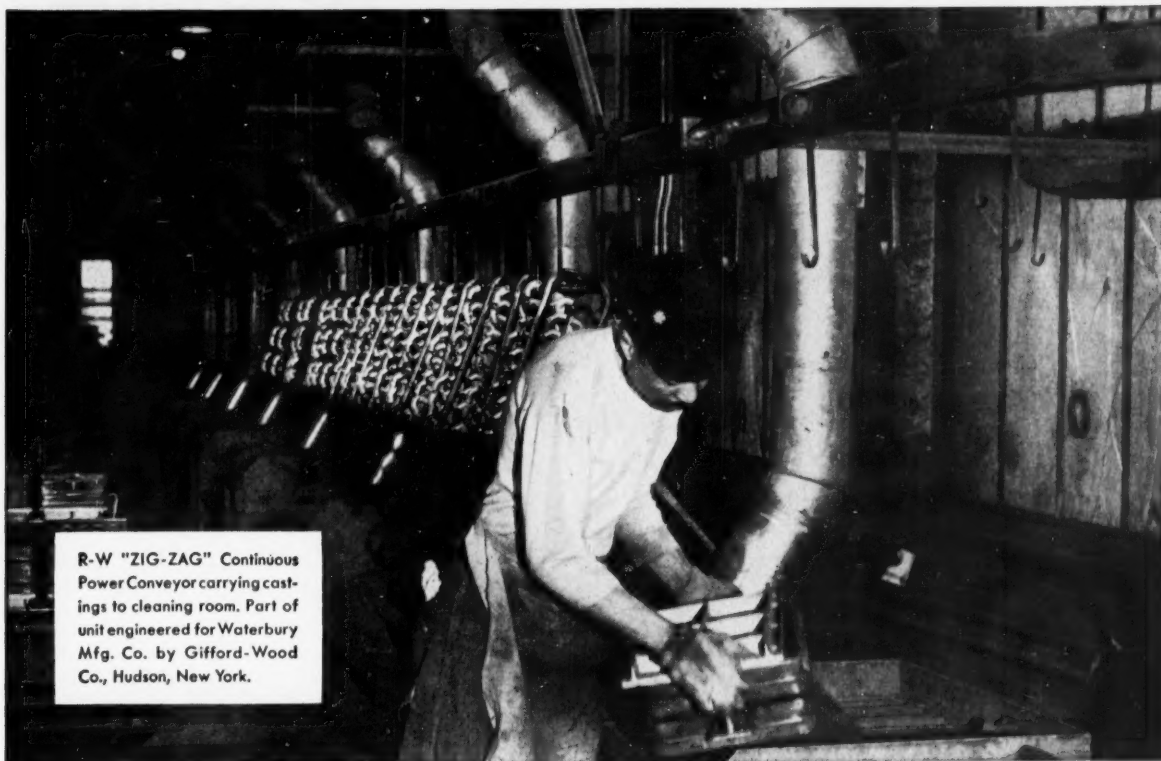
Write to us for complete information. Manufactured exclusively by Dempster Brothers, Inc.



One Truck-Mounted
Dempster-Dumpster Handles Scores
of Containers... All Designs... All Sizes

DEMPSTER BROTHERS, 6123 SHEA BLDG., KNOXVILLE 17, TENN.

Modern industry chooses Richards-Wilcox Conveyor Equipment



R-W "ZIG-ZAG" Continuous Power Conveyor carrying castings to cleaning room. Part of unit engineered for Waterbury Mfg. Co. by Gifford-Wood Co., Hudson, New York.

The key to materials handling efficiency is *flexibility*... the kind of flexibility you find in a R-W "ZIG-ZAG" Continuous Power Conveyor. It travels up, down, in, out and around... like water through a pipe... in most cases utilizing space that would otherwise be wasted. ZIG-ZAG moves steadily on the job, requiring a minimum of personnel and reducing bottlenecks and handling mishaps.

Because of these savings... in space, personnel, time and safety... the Gifford-Wood Company of

Hudson, New York, designed and installed a complete Richards-Wilcox ZIG-ZAG Conveyor System for the Waterbury Manufacturing Company, Division of Chase Brass & Copper Co. This unit, designed to handle castings after shakeout, effected remarkable savings in production space, overall production time and maintenance costs.

• • •

Find out how you can raise efficiency, lower costs. Write today for consultation. There's no obligation on your part.

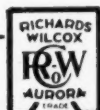


Enclosed Chain

Engineered for Economy and Flexibility

- Horizontal and vertical units alternate in a continuous chain traveling through special steel tubing.
- Complete flexibility for installation in any plant. Easily installed, easily changeable to conform to plant alterations.
- SAFE—all moving parts are fully enclosed.
- Low first costs. Low Power Factor.
- Standard horizontal or vertical curves—two-foot radius.

1880



1953

SLIDING DOOR HANGERS & TRACK • FIRE DOORS & FIXTURES • GARAGE DOORS & EQUIPMENT • INDUSTRIAL CONVEYORS & CRANES • SCHOOL WARDROBES & PARTITIONS • ELEVATOR DOOR OPERATING EQUIPMENT

Richards-Wilcox Mfg. Co.

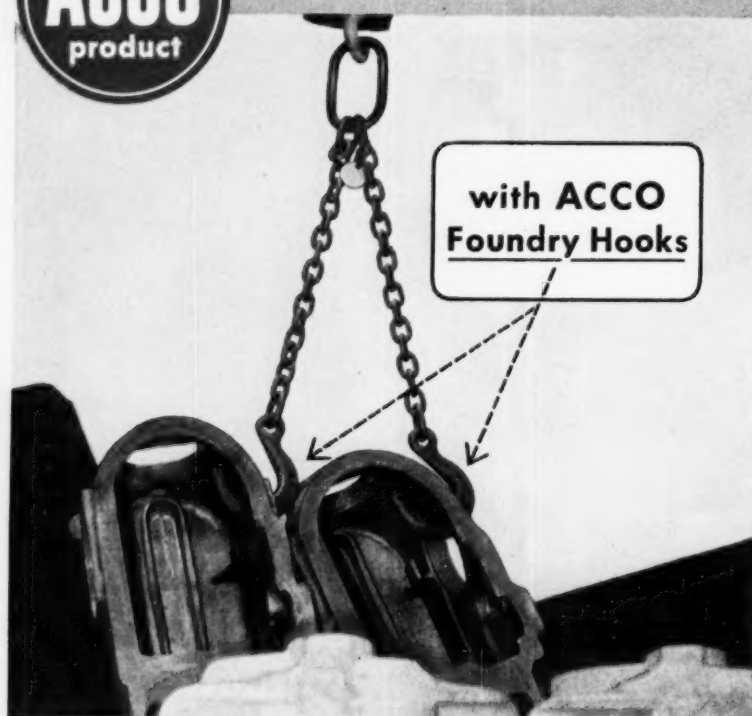
MATERIALS HANDLING DIVISION

420 THIRD STREET, AURORA, ILLINOIS

Circle No. 104 on Reader Service Card for more information



ENDWELDUR SLING CHAINS



with ACCO
Foundry Hooks

How You Can Speed Up Handling of Castings

● Castings frequently are odd shaped and hard to hitch to with regular sling hooks. So AMERICAN developed the series 500 ACCO Foundry Hook with rounded point and wide mouth that can be hooked to a wide variety of lifts.

These hooks are drop forged of the same material as the chain. They are built into ACCO *Registered* Endweldur Sling Chains at the factory and the complete assembly is proof-tested from bearing to bearing.

ACCO Foundry Hooks are safer than home-made hooks. And they're cheaper because you save the cost of fabricating and assembling to the chain in your plant. The completed unit bears the well-known ACCO *Registered* identification ring—your assurance of highest sling chain quality.

See your AMERICAN CHAIN distributor
or write our York, Pa., office for DH-130

ACCO



AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles,
New York, Philadelphia, Pittsburgh, Portland,
San Francisco, Bridgeport, Conn.

**American
Chain**

Circle No. 6 on Reader Service Card for more information

news from the
SALES FIELD

The Clark Equipment Co. has appointed a new dealer, **The Crunkleton Co.**, 5324 McCorkle Ave., Charleston, West Virginia. The new distributor will handle Clark's complete line of fork lift trucks, tractors, powered hand trucks and Ross carriers. The dealership is under the management of **Leslie D. Crunkleton Jr.**

John I. Swanson has joined the staff of **Union Steel Products Co.** as a sales engineer. He formerly was supervisor of the Works Control Laboratory of the Corning Glass Works television tube plant. In his new capacity as a sales engineer, he will be responsible for the company's research, development and fabrication of wire and tube type products.

Shipping Utilities Inc., 3107 Pine St., St. Louis, has been added to its distributor group by the **Parker Sweeper Co.**, according to **Fred R. Moore**, Parker vice president. The dealer's franchise includes central and eastern Kansas and Missouri and will be serviced by the company's offices in St. Louis, Wichita and Kansas City, Kan. **John G. Buettner** is president of Shipping Utilities and there will be 10 representatives working in the field.

Walter H. Douglas has been appointed to represent **Cone-Drive Gears** division of the **Michigan Tool Co.** in northern New Jersey, northeastern Pennsylvania, downstate New York and New York City area,

according to **Fred E. Birtch**, general manager. Douglas has been with the division for the past seven years working out of Detroit. His new headquarters will be at 163 Sunrise Parkway, Mountainside, N. J.

Barber-Greene Co. has announced the appointment of **Edward J. Curtin** as sales manager of the company's north-eastern area. This comprises all of New England, New York state and part of New Jersey. Curtin has established headquarters in Boston. He succeeds **Earle F. Lamprey**, who has been promoted to supervise export activities from the firm's New York Office.

G. N. Dow has been appointed Chicago district sales manager for the **Leschen Wire Rope Division of the H. K. Porter Co.**, according to **R. J. Dickson**, general sales manager. Dow recently was transferred from the Detroit territory. His new area includes northern Illinois, Iowa, Wisconsin, northern Indiana, Michigan and Minnesota.

The Orton Crane & Shovel Co. has announced the appointment of **Arthur E. LeGare** as sales engineer for the firm. He formerly was in the engineering department of the General Steel Castings Corp. In his new post he will represent Orton in the industrial and railroad markets.

A new stock-carrying factory warehouse and sales office has been established at 4384 E. Bandini Boulevard, Los Angeles, by the **Quaker Rubber Co.** to provide better service and deliveries to customers in the southwest, according to **G. A. Dauphinais**, vice president and general manager. The new branch is under the supervision of **James Joyner**.



an Original Idea Plus a Wright Speedway Hoist

• Here's a convenient method of material handling used by **P. R. Hoffman Company** of Carlisle, Pa. The **WRIGHT 1-ton Speedway Hoist** with trolley is on the second floor. The long-lift lets it raise or lower loads from ground level or basement. Electrical current is carried safely by overhead bus and a flexible remote control unit makes the hoist safe and easy to operate.

This is only one of innumerable ways you can use **WRIGHT Hoists** to speed the flow of material in your plant. **WRIGHT** makes electric hoists in sizes from $\frac{1}{4}$ to 10 tons; hand hoists from $\frac{1}{4}$ to 50 tons. They are modern in every respect, designed for modern material handling. They will give long, economical service. They will save you money.

Write today to our
York, Pennsylvania, office for literature
on **WRIGHT Speedway electric or**
WRIGHT Safeway hand hoists

ACCO



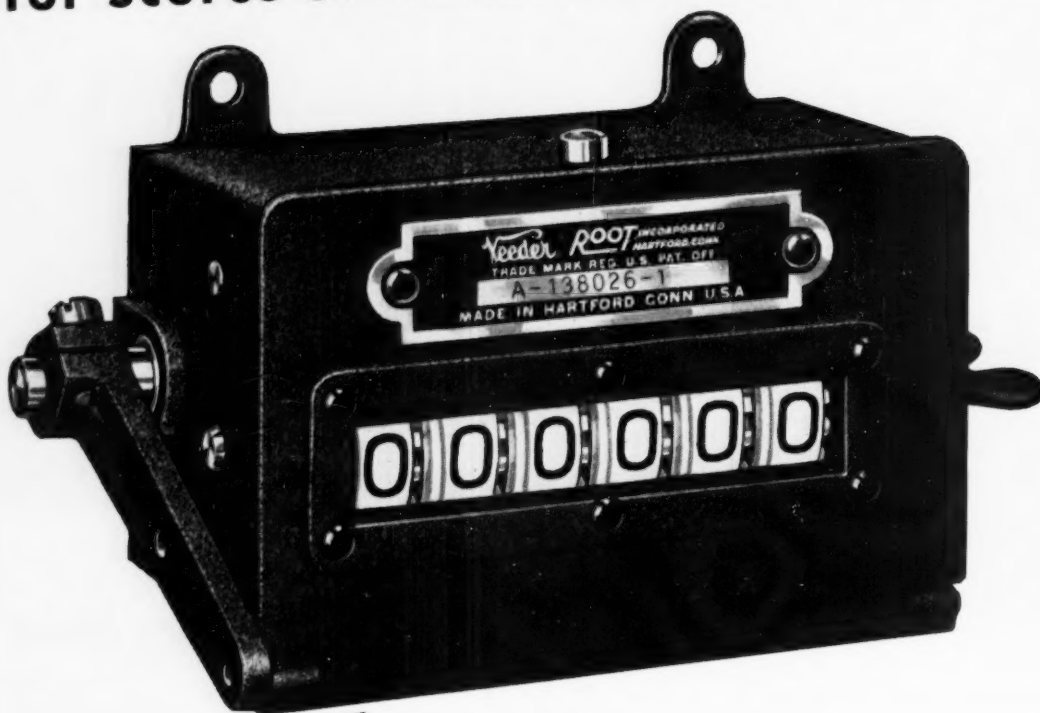
**WRIGHT HOIST DIVISION
AMERICAN CHAIN & CABLE**

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York,
Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

WRIGHT
Hoists
Trolleys
Cranes

BIG SCOREBOARD

for Scores of Manufacturing Processes



Added Evidence
that —

Everyone Can Count on VEEDER-ROOT

This husky long-lived Box-type Counter is available with 6 figures, in either the ratchet model, or in the new *geared* model with bearing inserts. This new gearing permits speeds of 1,000 counts per minute, which makes the counter adaptable to practically any manufacturing process where large figures are wanted for

easy reading at a distance. Figure out how this counter can be *built into* your product as a new sales advantage over competition.

Write:

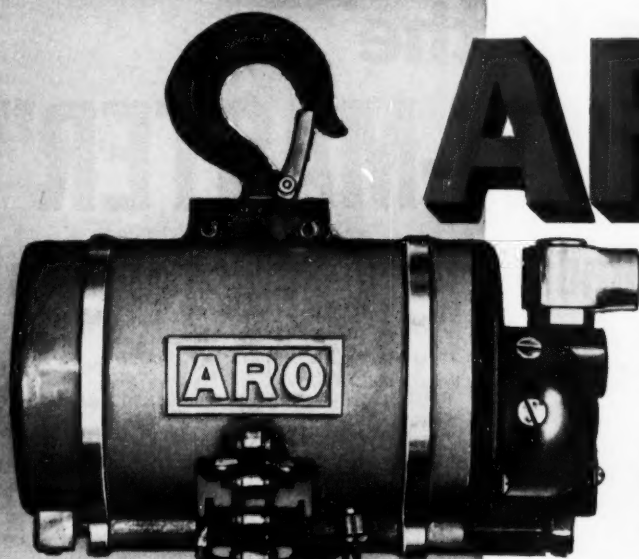
VEEDER-ROOT INCORPORATED
HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
Offices and Agents in Principal Cities



'The Name that Counts'

Circle No. 124 on Reader Service Card for more information



ARO

1000 pound AIR HOIST

for

SPEED...

Lift rate...
over 40 ft. per minute!

SIZE...

Overall length 10 $\frac{1}{4}$ "
weighs only 28 $\frac{1}{2}$ lbs.

SAFETY...

Betters all
safety requirements!

ACCESSORY EQUIPMENT



HOIST TROLLEY



HOSE TROLLEY



CHAIN BASKET

The Aro Equipment Corporation, Bryan, Ohio

Offices in All Principal Cities

In Canada—Aro Equipment of Canada, Ltd., Toronto, Ont.

ARO

AIR HOIST

Also . . . Air Tools . . . Lubricating
Equipment . . . Aircraft Products . . .
Grease Fittings

The Aro Equipment Corporation, Bryan, Ohio

Please send full details on the new ARO Air Hoist, without obligation.

Name

Company

Street

City State

Circle No. 12 on Reader Service Card for more information

This is the BENDIX "MULTI-MASTER"

... the 2-way Mobile Radio with a thousand uses!

1. The Bendix "Multi-Master" can be used as a fixed station.
2. It can be used as a mobile unit.
3. Easily adapted to narrow band operation.
4. It works on either AC or DC current.
5. It is available from 2½ to 60 watt output.
6. Pull up . . . pull out . . . or pivot for easier servicing.
7. It can be transported from one location to another.
8. It can be transferred from one vehicle to another.

It's a new, clean and rugged design. Light in weight, compact. All controls mounted on front panel.

The Bendix Multi-Master incorporates all the new and outstanding features of Bendix 2-way radio. It has range and power. Static free reception. Longer life components. Low power drain.

Bendix offers a complete line of accessories from hand sets to speakers, antenna to shock mounts . . . plus all technical help in obtaining license and complete system engineering.

It cost no more to own the best . . . so look at Bendix Radio before you buy. For complete details and specifications, write today to the address below.



BENDIX* RADIO

BALTIMORE 4, MARYLAND

A DIVISION OF BENDIX
AVIATION CORPORATION

Export Sales: Bendix International Division,
72 Fifth Avenue, New York 11, N. Y.

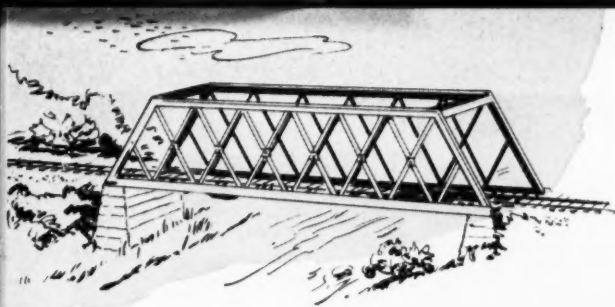


*REG. U. S. PAT. OFF.

Bendix Radio

THE MOST TRUSTED NAME IN

Circle No. 19 on Reader Service Card for more information



**BUILT LIKE
A BRIDGE FOR**

Rough Tough Service

**New GOULD
DIAMOND "Z" GRID**

Look at this illustration of Gould's new Diamond "Z" Grid. See the bridge-type construction—the husky diamond shaped active material retaining members. Note the *extra* large conductive members which not only conduct current to the lug with high efficiency but give still more strength to this most recent achievement of the famous Gould Laboratories.

Here's a grid that's built for rough, tough service, top performance and long life. Years ahead of requirements, it has *extra* strength for every application, *extra* ruggedness to withstand abuse, *extra* ability to deliver full power longer. Now more than ever—when you buy, buy Gould!



Specify
The GOULD "THIRTY"
Now, more than ever,
America's Finest
Industrial Truck Battery!

GOULD

INDUSTRIAL BATTERIES

NOW!

UP TO 16,000 LBS.

All the famous
Exclusive Job-Tested
Gerlinger Features on a

NEW

(106 inch)
**SHORT WHEELBASE
FORK LIFT TRUCK**

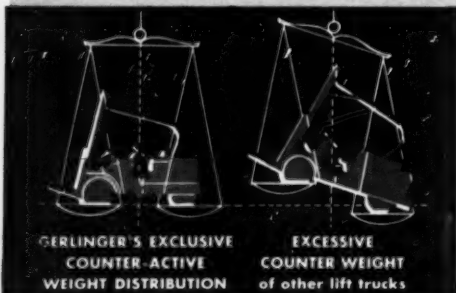


Shortest Tail Swing and Shortest Turning Radius of any 4 to 8-Ton Fork Lift Truck

With its 11'8" to 12'4" turning radius (according to capacity), this new Gerlinger fork lift truck...with the short 106-inch wheelbase...has all the balance, lifting power and traction of its 130-inch "Big Brother". Will literally "turn on a dime"!

Exclusive Counter-Action Weight Distribution

Truck can't teeter, and back wheels won't dig in...54% of the weight remains over the drive wheels even when unloaded! Guarantees dependable braking power at all times, longer tire life, less frame strain, maximum steering and operation ease.



5 MODELS...4, 5, 6, 7½ AND 8-TON CAPACITY...

106-INCH WHEELBASE WITH GERLINGER JOB-PROVED FEATURES TO SAVE TIME, MONEY AND MANHOURS

Gerlinger's heavy fork lift truck...with short wheelbase for easier maneuverability, sharper turning...is your answer where space is tight in lumber yard, mill, kiln or factory...or if your vehicles take a beating on rutted roads, through mud, sand, or snow. Regardless of load-size variations up to capacity limit of the specific model, perfect balance is assured, by Gerlinger's exclusive counter-active weight distribution. Any one of the "S" series shown here will outmaneuver and outlast any fork lift truck of comparable size.

GERLINGER 5-8 FORK LIFT TRUCK (4-ton capacity)

GERLINGER 5-10 FORK LIFT TRUCK (5-ton capacity)

GERLINGER 5-12 FORK LIFT TRUCK (6-ton capacity)

GERLINGER 5-15 FORK LIFT TRUCK (7½-ton capacity)

GERLINGER 5-16 FORK LIFT TRUCK (8-ton capacity)

GERLINGER 130-inch FORK LIFT TRUCKS...with Vickers Hydraulic Steering...available in wide choice of sizes.

Write for full details and specifications on the Gerlinger you need.



GERLINGER CARRIER CO., DALLAS, OREGON

Circle No. 54 on Reader Service Card for more information



in Equipment

Summaries of latest information from manufacturers. For more details, use the free-mailing Reader Service Card.

Torque Converter on "Payloaders"

A 3-element type hydraulic torque converter, which multiplies the torque output of the engine in direct proportion to load requirements, has been incorporated in the gas and diesel engine models of the HM "Payloader" Tractor-Shovel as well as the TM "Payloader" Tractor, products of The Frank G. Hough Co. It provides a smoother drive, reduces the amount of effort previously required by the driver, lowers maintenance, and prolongs life of equipment.

Circle No. 150 on Reader Service Card for more information



Compact 10,000 Pound Fork Truck

Latest model fork truck of Elwell-Parker Electric Co. is said to be a rugged unit of 10,000 lb. capacity, electric powered, hydraulically operated—with front wheel drive, rear wheel steering, 61 in. wheelbase, and 42 in. forks, allowing turns in intersecting aisles of 83 in. Other specifications include: overall length, less forks, 97 in.; height, uprights telescoped, 83 in.; height, uprights extended (36-in. vertical fork leg), 146 in.; maximum lift, 110 in.

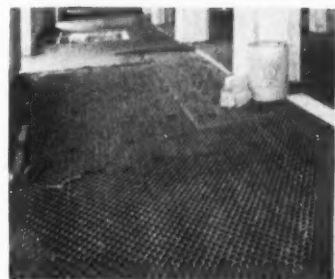
Circle No. 151 on Reader Service Card for more information



Steel-Reinforced Flooring

A "packaged unit" heavy duty flooring has been announced by United Laboratories, Inc. Called Steel Rock, the new flooring is said to combine for the first time a heavy steel mesh and special filler as a complete unit for surfacing floors subjected to extra-tough abuse like industrial truck traffic. A resilient filler is used in the grids. It compacts to meet the level of the steel ribs, thereby permitting wheels to ride on steel without noise and slipperiness of solid steel surfaces.

Circle No. 152 on Reader Service Card for more information



SR-4 Cells in New Series

"Precision" and "extra precision" type Baldwin SR-4 load cells for measuring forces and weights are now offered by Baldwin-Lima-Hamilton Corp. in two new series. Including 18 compression load cells (Type CX and CXX) in 9 capacities from 500 to 200,000 lb., and 16 tension load cells (Type TX and TXX) of 8 capacities from 500 to 100,000 lb., they are interchangeable with standard cells. Essential difference is finer tolerances for high accuracy measuring and weighing.

Circle No. 153 on Reader Service Card for more information





Hydraulic Pusher Attachment

Manual unloading is eliminated with a hydraulic pusher now provided for fork trucks produced by The Yale & Towne Manufacturing Co. Particularly suitable for work in railroad box cars and highway trucks, it is shown in action positioning a load in the latter. Loads can be carried directly on forks, either standard or chisel type. Control is by lever located next to hoist and tilt levers.

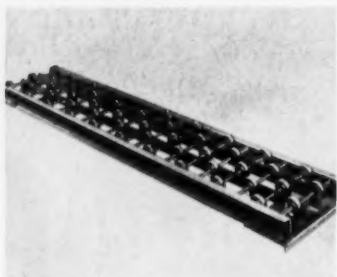
Circle No. 154 on Reader Service Card for more information



Belt Sheds, Retains Water

A dual-purpose rubber conveyor belt, the "Riffle-Grip," has raised molded ridges formed in a continuous series of chevron patterns. Operating on predetermined conveyor incline angle, with idlers at specified angle, ridges channel water from material conveyed to edges of belt. Adjustment of incline and idler angle changes chevron pattern into horizontal carrying ribs which retain water, permit even distribution of moisture throughout material. Manufacturer is The B. F. Goodrich Co. Ind. Prods. Div.

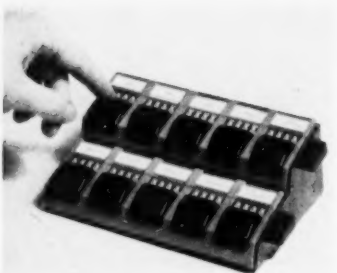
Circle No. 155 on Reader Service Card for more information



Aluminum Conveyor Sections

In wheel and roller types, portable, aluminum, gravity conveyor sections now produced by E. W. Buschman Co. have approximately half the weight of equivalent steel units, with which they are said to mate perfectly. They come in standard 5 to 10 foot straight sections and three widths—12, 15 and 18 inches wide overall. Reversible curve sections are in the same widths and 30, 45, 60, and 90 deg. turns. Various spacing of wheels and rollers can be provided to suit loads.

Circle No. 156 on Reader Service Card for more information



Multiple-Unit Reset Counter

Any numerical break-down or counting job can be accomplished with the Vary-Tally, a new, portable multiple-unit reset counter manufactured by Veeder-Root, Inc. Arranged compactly on stands in tiers up to 6 high and 12 wide, as many as 72 individual units can be used. Finger-tip pressure registers each count from one to 9999. Reset knob instantly returns all counters in any tier to zero. Panels are provided over reading lines for descriptive legends.

Circle No. 157 on Reader Service Card for more information



Roll Up-End-er

For moving and up-ending rolls of cloth, paper, plastic, steel, etc., a Special Hand Hydraulic Roll Up-ender has been developed by Service Caster and Truck Corp. It has 1000 lb. capacity, 32 inch lift, carries a roll in horizontal position, and tilts it hydraulically to vertical for storage. The unit has foot-operated floor lock and fast-speed hydraulic pump. It can be equipped with hydraulic release check for use as a roll-lowering device.

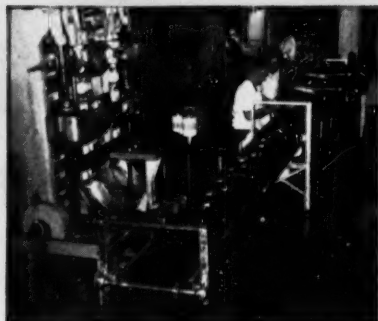
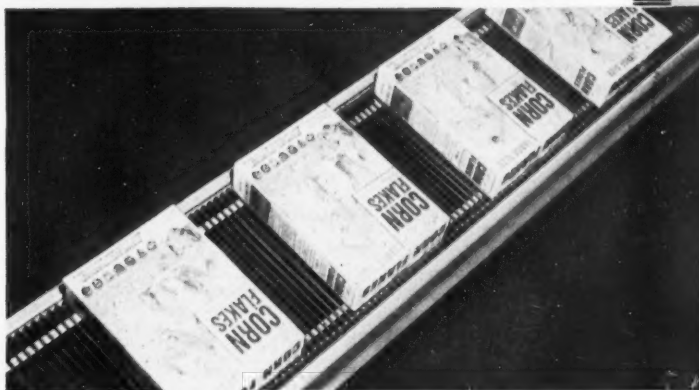
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(Continued on page 92)

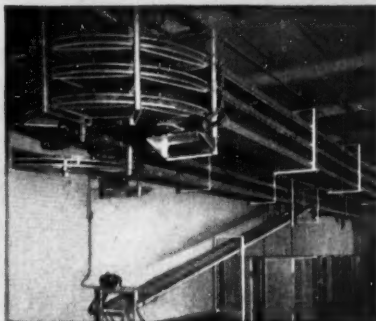
USP WENDWAY

Automatic answer to your "light product" conveying problems!

If you have a light product, 20 lbs. or less . . . if you must move it smoothly, efficiently, from one process to the next . . . if you want an automatic selective conveyor system to do the job dependably and at consistent savings in time and manpower . . . then Wendway is for you! Wendway specializes in moving light goods swiftly, quietly and safely anywhere throughout your plant or warehouse. Standardized, self-powered sections may be operated by remote control to eliminate man hours all along the way. Wendway can be installed overhead or in multiple tiers to save your floorspace . . . will pass through walls, go upstairs or down. Whether your problem is assembly, processing, packing, orderpicking or checking, you'll find Wendway pays for itself from the day it starts to work.



PACKAGING OR ASSEMBLY operations can be synchronized to production, thanks to Wendway's variable speeds. Here fancy nuts are Wendwayed from bag loaders through a series of stapling machines and on to loading boxes. Steel wire belt is clean, easy to keep clean.



OVERHEAD COOLING for cooked or heated products saves you time and floorspace. Wendway takes 'em up, cools 'em off and brings 'em down, ready for further processing. Individual gearhead motors can be remote controlled to give you a completely automatic operation.



LOADING OPERATIONS get a big boost with selective Wendway tiers reaching exactly the areas you want, when you want them, from any part of your plant. Wendway passes through walls, goes up, down or around. Versatility of standardized sections keeps installation costs low, maintenance costs lower.



Wendway's special steel wire belting rides smoothly over powdered iron sprockets mounted on sturdy steel shafting. Cannot slip or run out of line. Easy to clean and keep clean.

Belt track and channel of heavy gauge steel, galvanized for longer life and appearance. Sturdy leg structures of galvanized steel angle frames bolted and welded. Exclusive pure Nylon belt guides and bearing strips for quiet, friction-free operation.



Individual 1/4 h.p. gearhead motors synchronize each Wendway section to required speeds. Drip-proof, sanitary. Equipped with magnetic starters and start-stop station buttons.

Formed steel guards for all chain drives and sprockets protect equipment and personnel. Hinged for ready access to working parts for inspection or maintenance.

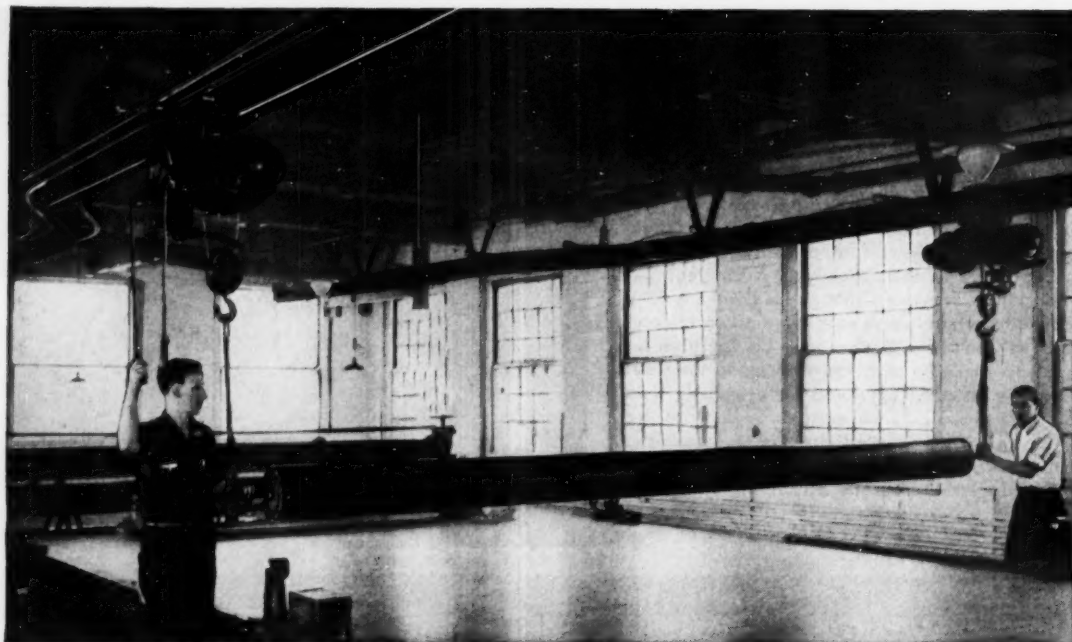
Detailed information on Wendway is available on request. Our conveyor engineers are also at your service. Let them show how quickly Wendway could cut costs for you.

UNION STEEL PRODUCTS COMPANY
ALBION, MICHIGAN

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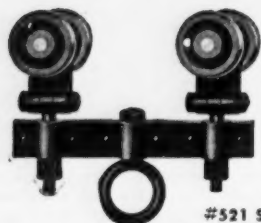
1903 Our Golden Anniversary 1953





OVERHEAD CONVEYING EQUIPMENT

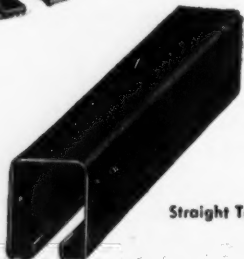
save money - install it yourself!



#521 Single
Swing-Out Carrier



#702-S Side
Ear Bracket



Straight Track

No need for expensive installation costs with Coburn Overhead Conveying Equipment. Coburn track, brackets and carriers are simple in design . . . can be set up quickly and easily by your own mechanics or other plant personnel. What's more, the sectional design of Coburn track permits inexpensive rearrangement or extension as the need occurs.

Find out how you can get all the advantages of modern overhead conveying equipment . . . while at the same time keeping investment and installation costs to a minimum. Write for Catalog #220 to Coburn Sales and Engineering, 56 Sterling Street, Clinton, Massachusetts.

THE COLORADO FUEL AND IRON CORPORATION — Denver, Colorado
PACIFIC COAST DIVISION — Oakland, California
WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo
Chicago • Detroit • New Orleans • New York • Philadelphia

COBURN PRODUCTS

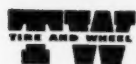
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



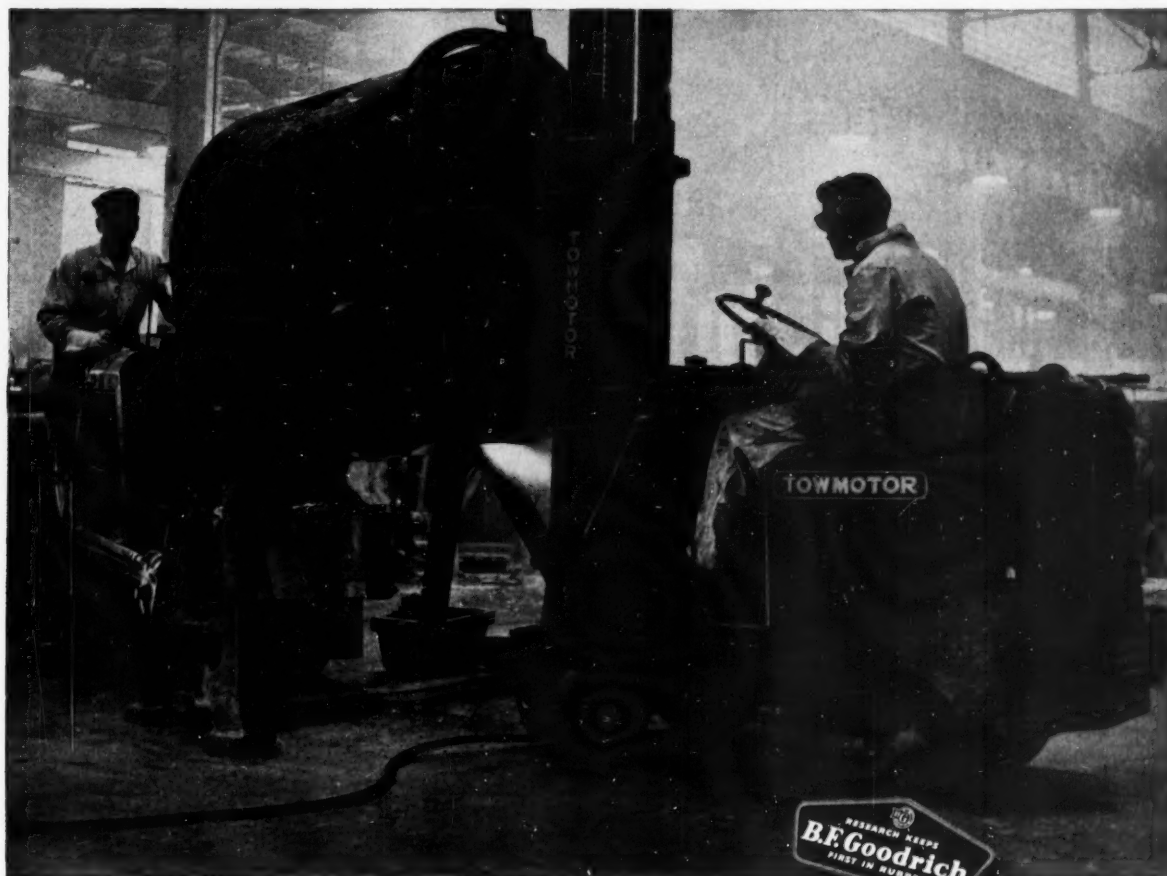
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Act now — have a money-saving

B.F. Goodrich



ANALYSIS made in your plant today!



● You can save as much as 50% on industrial tire costs with the money-saving B. F. Goodrich Tire and Wheel Analysis Plan! Call in your local B. F. Goodrich representative today. He's trained to study your materials handling set-up. He knows the kind of industrial tires—the tread compounds and tread designs—that will give the best service at lowest cost in your type of work. He'll recommend these tires to you. And this service costs you nothing, puts you under no obligation.

Industrial tire users across the country have benefited from the recommendations of the B. F. Goodrich Tire and Wheel Analysis man. They have saved up to 20% on *maintenance costs alone* by following the suggestions he makes. Why not find out now how much the B. F. Goodrich Tire and Wheel Analysis Plan can save you!

You can be sure the advice you get from your BFG man will be impartial. He has no axe to grind for any particular type of industrial tire—for B. F. Goodrich makes, and BFG retailers sell, a complete line of industrial tires.

Call your local B. F. Goodrich representative today and ask him to make a free Tire and Wheel Analysis in your plant, or mail the coupon. A special TW Analysis Plan is available for manufacturers of industrial handling equipment.

Specify B. F. Goodrich tires when ordering new equipment



The B. F. Goodrich Company
Department TW-328, Akron 18, Ohio

Please send me:

- ☐ Additional information on your new Tire and Wheel Analysis Plan
- ☐ A free copy of your "Industrial Tire Guidebook"

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

Circle No. 57 on Reader Service Card for more information

Change the clutch in

30
minutes!

**LESS DOWN TIME
MORE "PROFIT TIME"**



Only with

BUDA FORK LIFT TRUCKS

Let your *own* men change the Buda clutch in 30 minutes—saving hours . . . days . . . *weeks* of costly downtime! Then see them strip the Buda Truck for service in 22 seconds—strip for overhaul in 22 minutes! See proof that Buda is the fastest, safest, most economical. See your near-by Buda Distributor . . . or write now for new, free *Facts Book*.

BUDA

THE BUDA COMPANY
HARVEY, ILLINOIS



Circle No. 23 on Reader Service Card for more information

HIGHLIGHTS of the month's NEWS

IN THE MIDST of accelerating interest in and speculation on the automatic factory", there has come a message that brings the subject to practical reality for the present. It was delivered by R. C. Sollenberger, Executive Vice President of the Conveyor Equipment Manufacturers Association, to the Falls Cities Chapter of the American Material Handling Society during their November meeting at Louisville, Ky.

Mr. Sollenberger, by virtue of his practical background and experience as well as his over-all executive view of the material handling industry, is one of the country's best qualified authorities on the subject of mechanical handling. He stated that the completely automatic factory—manned by a few technicians and a technical maintenance crew—is entirely feasible from the engineering viewpoint but probably not economically practical at this time; that, even though great progress is being made in the development of automatic handling devices, the fully automatic plant is a long way off for the production of most items. The inflexibility in a single, gigantic, production machine operations would make it impractical for many products.

Two conditions, he said, must exist before completely automatic production can be profitable. They are (1) a stabilized product and (2) a continuing market with but minor fluctuations in demand. He pointed out that, even in many automobile plants, profit margins are so narrow that companies are thrown in the red when any breakdown or shortage of parts or materials makes them lose as little as five percent of working time.

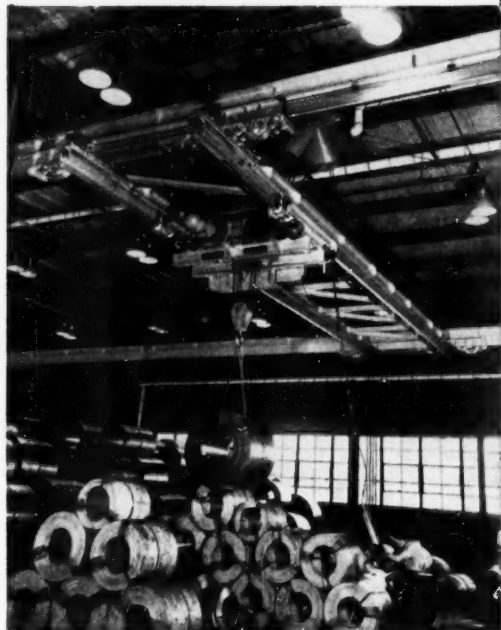
Contrary to widespread belief, Mr. Sollenberger affirmed, tremen-

(Continued on page 95)

USE

MonoRail CRANES

- ... Where Space is Limited
- ... To Handle Variable Jobs
- ... For Low Maintenance Cost



These are just a few reasons why American MonoRail Cranes are gaining in popularity and are being installed in increasing numbers of plants the country over. Call in your American MonoRail representative and have him tell you all the advantages of MonoRail Cranes such as—ease of handling—smooth travel—strength—safety interlocks—power operation and **interlocking carrier service between and beyond the craneways**. Consultation in connection with any handling problem is available without obligation.

Send for your copy
of C-1 Bulletin



AMERICAN

OVERHEAD
HANDLING
EQUIPMENT

MonoRail

COMPANY

13129 ATHENS AVENUE • CLEVELAND 7, OHIO

Circle No. 8 on Reader Service Card for more information



**CRAWLING is
often necessary**

but for SPEED

**there's nothing like
rolling on WHEELS!**



Under many conditions crawlers are the most practical type of mounting. BUT, very often traction is not much of a problem for shovels, cranes and draglines and you can make terrific savings by using a high speed LIMA PAYMASTER on wheels.

The picture at the right shows a LIMA Type 34-M PAYMASTER crane, equipped with a 35-ft. boom, unloading coal from a barge at an eastern Pennsylvania power plant. Note that it is mounted on an undercarriage with 12 rubber tired wheels.

This LIMA 34-M is a natural for industrial plants . . . it offers fast mobility between widely separated jobs, traveling up to 8.24 MPH on a 2.75% grade and 0.94 MPH on a 22.5% grade with four-speed transmission. Just one man is needed to operate it and a single engine powers the crane motions and propels the carrier. It can lift up to 20 tons and is readily convertible to a dragline.

If you would like to know more about how the LIMA Type 34-M PAYMASTER will pay off with speed and efficiency for your operations, drop a note to—



LIMA DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA

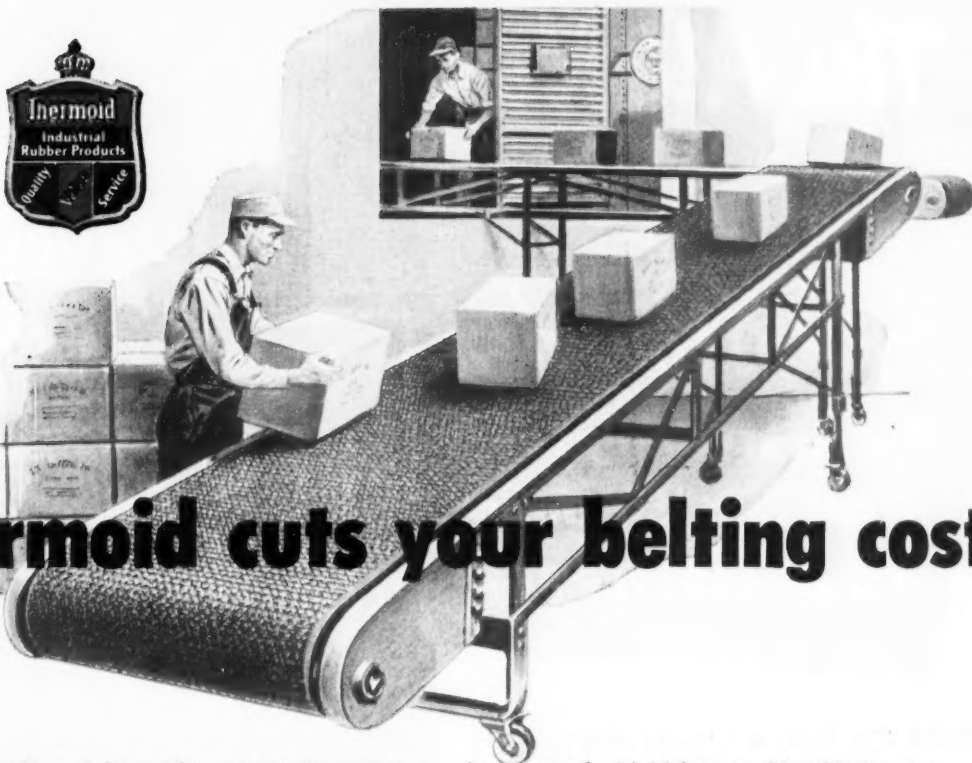
SHOVELS • CRANES
DRAGLINES • PULLSHOVELS



Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

Circle No. 16 on Reader Service Card for more information



Thermoid cuts your belting costs

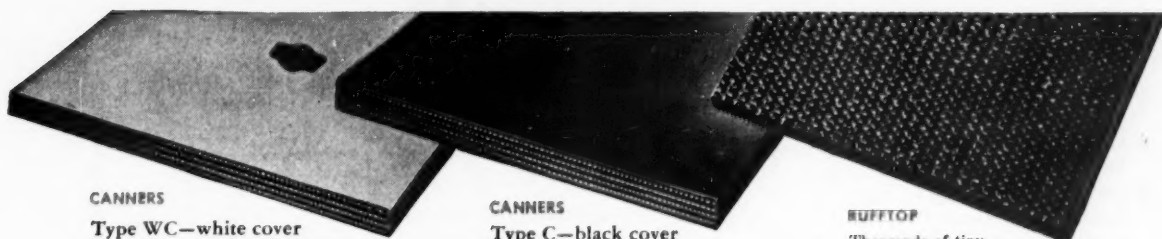
Regardless of the weight, content, temperature or other characteristics of the materials you handle, there's a Thermoid Conveyor Belt that will stay on the job longer, reducing your handling costs.

Thermoid "built-for-the-job" Conveyor Belts, like those shown below are providing maximum service for leading processors and packers, coast to coast. Strong cotton fabrics, thoroughly

impregnated with high-test rubber friction, are combined with tough, wear-resistant rubber covers. Welded together under extremely high pressures to assure exceptionally strong, durable belting.

Your Thermoid Distributor can help you select the belt best suited to your needs. If your problem is unusual, he'll call an experienced Thermoid Sales Engineer.

Thermoid Belting specifically designed for food processing applications:



CANNERS

Type WC—white cover
Type PC—peach color cover

For sorting and carrying fruits and vegetables. Acid-resistant. Imparts no odor or taste to food.

CANNERS

Type C—black cover

Ideal for use in portable conveyors where food is not in direct contact with belt. For handling packages, refuse, or waste.

BUFFTOP

Thousands of tiny, irregular-shaped gripper points enable this belt to carry packages up inclines of 30-35° with no backslip.

Write for Thermoid Conveyor Belting Catalog #3679, containing full engineering data.

Thermoid

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

Circle No. 117 on Reader Service Card for more information

The All New

4000 Pounder

Has Everything You Want in a "Sit-Down" FORK LIFT TRUCK

Model D-424

4,000 lbs. cap.

at 24" load center

83" hydraulic mast

lift height 108"



Here are Just a Few of the Trend-Setting Features...

- ◆ **Chrysler 65-bhp 6-cyl. Gas Engine.**
- ◆ **Chrysler Gyrol Fluid Coupling.**
- ◆ **Mobil-Matic Drive** for smooth, positive power transmission through the MOBILIFT Oil-Immersed, Multiple-Disc Clutch and **Constant-Mesh Transmission**—2 speeds forward, 2 reverse.
- ◆ **One Lev-R-Matic Control** for forward and reverse...just **Push** to go forward—**Pull** for reverse—**NO CLUTCH PEDAL—NO GEARS TO SHIFT!**
- ◆ **MOBILIFT Full-Floating Drive Axle.**
- ◆ **Hydraulic Service Brakes.**
- ◆ **Combination Ball-Bearing Worm & Nut Type Steering.**
- ◆ **Easy to Get On and Off**—no obstructions—free access from left or right side.
- ◆ **One-Piece Hood Raises** for Easy Service Accessibility.

These and many more exclusive MOBILIFT features make this new D-424 the lift truck for you! ...Send coupon for complete details.

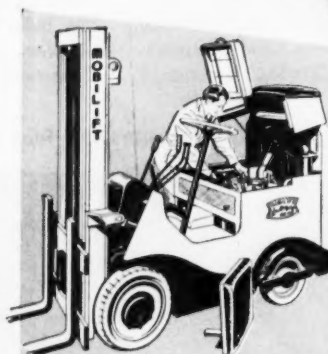
MOBILIFT CORPORATION, DEPT. B
835 S. E. Main, Portland 14, Oregon

- ☐ Please send me complete information on the D-424.
☐ Please have your sales representative contact me.

Name _____ Title _____

Street _____ City _____ State _____

Company _____



**DESIGNED FOR OPERATOR
COMFORT—SAFETY.**

No obstructions on floor.
Easy to get on and off from
left or right side. Controls
and instruments placed for
easy reach and view.

EASY TO SERVICE
One-Piece Hood hinged
for easy access to engine
compartment.



MOBILIFT CORPORATION

835 S. E. MAIN STREET, PORTLAND 14, OREGON

2317 W. 18TH, CHICAGO • 790 PATTERSON AVE., E. RUTHERFORD, N. J.

2724 TAYLOR STREET, DALLAS • 2730 SAN PABLO AVENUE, BERKELEY

1113 SPRING STREET, N. W., ATLANTA

Circle No. 84 on Reader Service Card for more information

The Most Important Safety Development in Exhaust Fume Control . . . Death to Carbon Monoxide and Hydrocarbons

The OCM Catalytic Exhaust

A Houdry Catalyst Development

A death sentence for two killers — a proven answer to one of industry's most critical problems — that's what the OCM Catalytic Exhaust means to you today.

You know the deadly risk of carbon monoxide wherever gasoline-powered equipment is used indoors. The hydrocarbons in exhaust fumes are even more dangerous. Now, with the OCM Exhaust, both these threats to life and health can be easily, economically ended.

Now, with the OCM Exhaust, you can operate lift trucks, tow trucks, loaders, auxiliary generators — *any type of machinery run by an engine burning non-leaded gasoline* in even the most closely confined areas — continuously, efficiently, *safely*. And *without the cost of extensive ventilation systems*.

The OCM Catalytic Exhaust eliminates 95% or more of the carbon monoxide — 99% of the hydrocarbons — from any engine in which you use non-leaded gasoline. Connected to the engine exhaust manifold, strong, compact catalytic units "burn out" harmful, foul-smelling fumes and odors before they reach the air you breathe.

Think of the significance. The ex-



(1) Connection to engine exhaust manifold. Cubic inch displacement of engine determines number of catalytic units needed. Almost any size engine can be equipped. Tested and listed by Underwriters Laboratories, OCM is strong — rupture-proof under explosion. • (2) Venturi or air inlet connected directly to exhaust manifold flange. Introduces fresh air into exhaust gas stream to provide necessary oxygen. • (3) Fresh air filter prevents contamination — keeps foreign matter from entering exhaust system. • (4) Catalytic units here eliminate carbon monoxide, hydrocarbons, fumes and odors. Units give 2000-2500 hours of trouble-free service — can then be quickly, economically replaced. OCM Exhaust imposes no more back pressure than standard muffler — often less. A thermocouple connected with pyrometer on instrument panel keeps constant check on catalyst efficiency. Non-leaded gasoline must be used.

haust fume problem is great and growing. Now, with the OCM Exhaust, you can have cleaner, safer air inside your plant. For your employees this means an end to fume-caused headaches, eye irritation and nausea — perhaps serious undermining of health. For *you* it means all the advantages of higher employee productivity and morale.

Easily Installed By Your Own Mechanics

The OCM Catalytic Exhaust is designed to replace the standard gasoline engine muffler. It is available as original equipment from leading concerns such as *Clark Equipment Co.* — or can be fitted right on your present gasoline engines. Your own mechanics can install it quickly, easily, without changing clearances.

The OCM Catalytic Exhaust is today a proven success — used by many of the country's biggest industries.* Developed by the noted inventor, Eugene Houdry, who discovered the catalytic cracking process and who

has given half a lifetime to catalytic research, the OCM is the most important safety development in exhaust fume control ever produced. Wherever you operate gasoline-powered equipment indoors — even part time — you have a real, a critical, need for the OCM Catalytic Exhaust. Write now for complete technical information and name of nearest supplier.

* Names of users on request

OXY-CATALYST, Inc. WAYNE, PA.

Send in the coupon below for new illustrated folder on the OCM Catalytic Exhaust, and complete technical information.



OXY-CATALYST, Inc., Wayne, Pa.

Send me complete technical information on the OCM Catalytic Exhaust and name of nearest supplier.

Name _____
Firm Name _____
Street _____
City _____ State _____

NOTE. This company makes catalysts for air pollution control and waste heat recovery in drying ovens, incinerators, oil refineries, and many other industrial operations. Write for details.

Circle No. 90 on Reader Service Card for more information

Literature

featured in this month's advertisements

The **Worksaver** line of electric lift trucks provide the flexibility, lighter weight and lower operating cost of small trucks along with all the features and adaptability of big truck operation, according to literature available from the Yale & Towne Mfg. Co.

Circle 130 on Reader Service Card

Bulletin No. 200 entitled, "Union Special Filled Bag Closing Machines," contains all the information necessary to finding the equipment necessary to meeting your bag closing problems. It may be requested from the Union Special Machine Co.

Circle 121 on Reader Service Card

Complete information concerning the toughness and ability of Armadillo conveyor belting to withstand abnormally rough usage is available in literature which may be obtained from the Main Belting Co.

Circle 74 on Reader Service Card

A six-page special report on the applications of Baker attachments to various loads is obtainable from the Baker-Raulang Co. The attachments are adaptable to the complete line of Baker Electric fork lift trucks.

Circle 132 on Reader Service Card

Conveyor users will be interested in obtaining Bulletin No. 63-D from the Standard Conveyor Co. covering its complete line of gravity and powered roller conveyor units.

Circle 112 on Reader Service Card

The variety of jobs that can be performed by Lorain mobile cranes in yard handling operations is told in literature available from the Thew Shovel Co. They are said to be able to move more material faster and at a lower cost.

Circle 118 on Reader Service Card

How American Railroads are able to reduce operating expenditures considerably is explained in literature obtainable from the Pittsburgh Steel Products Co. It covers the applications of cargo-holding partitions for box cars.

Circle 93 on Reader Service Card

Every truck can be made a scale, according to literature available from the Martin-Decker Corp. Its lift truck scale permits the driver of the truck to weigh his load as he lifts and transports it.

Circle 75 on Reader Service Card

Hinged steel conveyor belts are described in literature released by May-Fran Engineering, Inc. Hot, wet or extremely abrasive scrap metals cannot harm the steel belting, the manufacturer maintains.

Circle 78 on Reader Service Card

A yard ramp that can be positioned by one man and is capable of cutting truck loading time in half is described in literature obtainable from the Magnesium Co. of America.

Circle 73 on Reader Service Card

A new illustrated folder giving complete technical information on the OCM Catalytic Exhaust attachment for gasoline powered industrial trucks is available from Oxy-Catalyst, Inc. The unit is said to make carbon-monoxide fumes harmless.

Circle 90 on Reader Service Card

The **Blue Book of Packaging** and other literature about both round and flat steel strapping may be requested from the Gerrard Steel Strapping Div. of U. S. Steel Corp. The booklet compiles advice from experienced Gerrard engineers on troublesome packaging problems.

Circle 55 on Reader Service Card

Numerous Cost-cutting ideas are said to be contained in a booklet entitled "The General Box," which may be obtained from the General Box Co. Results of the company's laboratory test facilities are available in helping solve new and future shipping problems.

Circle 52 on Reader Service Card

Complete portability is the big feature emphasized in literature available from Alvey-Ferguson Co. in describing its LiveRail wheel conveyor sections. The material to be transported determines the number of rails needed, which pares the cost of the conveyor to only what is actually needed, according to the manufacturer.

Circle No. 5 on Reader Service Card



HIGH-LIFT PLATFORM WORKSAVER

Get big truck lift... with small truck thrifft...



PALLET WORKSAVER



TRACTOR WORKSAVER



PLATFORM WORKSAVER



HIGH-LIFT FORK WORKSAVER

YALE WORKSAVERS

Smaller in size... lighter in weight... lower in cost

YALE WORKSAVER ELECTRIC TRUCKS are the perfect solution where plant and warehouse facilities . . . or limited budgets . . . had previously ruled out mechanical handling operations. YALE WORKSAVERS lift, move and stack materials over low-load flooring . . . unreinforced ramps and elevators . . . freight cars and trucks . . . save time, space, manpower and money.

Industries of all kinds choose YALE WORKSAVERS because they know the YALE name and reputation. They count on the versatility of WORKSAVERS . . . to do the job better, more economically. Contact your local YALE Representative or complete the coupon for a demonstration. Ask about the complete range of attachments that makes the WORKSAVER the most versatile tool in your plant.

YALE*

**MATERIALS
HANDLING EQUIPMENT**

*Registered Trade Mark

MAIL THIS COUPON TODAY

The **YALE & TOWNE** Manufacturing Co., Dept. 412
Roosevelt Blvd. and Haldeman Ave., Phila. 15, Pa.

Please have your local representative call for an appointment

Company _____

Name _____ Title _____

Street _____ City _____ State _____

In Canada write: The Yale & Towne Mfg. Co.,
St. Catharines, Ontario, Canada

Gas, Electric, Diesel Lift Trucks • WorksaVERS • Hand Trucks • Hand and Electric Hoists • Pul-Lifts

Circle No. 130 on Reader Service Card for more information

FLOW • DECEMBER, 1953

Every Day...

MORE PLANT EXECUTIVES
AND METHODS ENGINEERS
ARE FINDING IT EASIER TO

let
BIG JOE

**hydraulic
lift trucks
do it!**

BATTERY UNITS
WITH BUILT-IN CHARGER

6 AND 12 VOLT
POWER SYSTEMS

30 MODELS FROM WHICH TO CHOOSE !

Low priced BIG JOE manual or battery operated units permit one man use on any job too big to do well by hand and too small to justify the use of large, expensive equipment. Loading and unloading trucks or freight cars—moving materials to and from the stockroom through narrow aisles—stacking boxes and bales, tote pans, dies, jigs—lifting things that are hard to get hold of—these are only a few of the tasks that BIG JOE is BUILT to do BEST.

Write for literature and information on demonstration
in your plant today.

BIG JOE MANUFACTURING
COMPANY

901-04 W. JACKSON BLVD. CHICAGO 7, ILL.

DISTRIBUTORS IN PRINCIPAL CITIES



Circle No. 134 on Reader Service Card for more information

AD LITERATURE

Continued

Assistance in analyzing your industrial tire needs and recommending the best tire for your particular operation may be gained from literature available from the Goodyear Tire & Rubber Co.

Circle 58 on Reader Service Card

Automatic Transportation Co. claims a "first" in gaining Underwriters' Laboratories approval of its type EX and EE industrial trucks. Complete information on the approval is contained in literature available from the company.

Circle 14 on Reader Service Card

No maintenance and no replacement is the feature brought out in Catalog No. 210 which may be requested from the Arguto Oilless Bearing Co. It covers the firm's line of conveyor roll bearings.

Circle 10 on Reader Service Card

The Industrial Tire Guidebook along with detailed information on its industrial tire and wheel analysis service may be obtained from the B. F. Goodrich Co. Companies availing themselves of the service have reported up to 20 percent savings in tire costs, according to Goodrich.

Circle 57 on Reader Service Card

How Evans D-F Loader equipped railroad cars cut damage costs for shippers is told in literature obtainable from the Evans Products Co. The equipment is said to first secure the load, then support the load, and lastly separate the load.

Circle 45 on Reader Service Card

All the extra features available to electric truck operators are described in an illustrated booklet available from the Elwell-Parker Electric Co. The complete E-P line of industrial trucks is cataloged.

Circle 43 on Reader Service Card

New

MERCURY INDUSTRIAL TRACTORS

Here it is...the completely new MERCURY "Banty." A small, rugged 4 wheel gasoline tractor with a turning radius of only 62". Features new double reduction drive axle with demountable wheel rim and tire assemblies...self-energizing hydraulic brakes...new semi-elliptic spring suspension, front and rear...cushion or pneumatic tires...all-new automotive type steering plus many other unusual features.



Model 460

"Banty" (Gas Powered)

Available in Two Capacities:
2300 and 3000 lbs. DBP.



Model 550

"Tug" (Battery Powered)

Available in Two Capacities:
2000 and 2500 lbs. DBP.

The compact, versatile, new MERCURY "Tug" electric tractor. Features *automotive type steering*...4-speed magnetic contactor control with timed acceleration and controlled plugging...new type double reduction drive with demountable wheel rim and tire assemblies...self-energizing hydraulic brakes and new type semi-elliptic spring suspension. Available in twin-3 wheel, or 4 wheel model with wide front tread.

MERCURY

FORK TRUCKS · TRACTORS · TRAILERS

Over 41 years experience in the manufacturing, designing, and installation of material handling equipment.

MERCURY MANUFACTURING COMPANY
4154 S. HALSTED ST., CHICAGO

GENTLEMEN: Please send me information on the following:

- ☐ "Banty" Tractor Model 460
☐ "Tug" Tractor Model 550
☐ Both "Banty" Model 460 and "Tug" Model 550

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____



The Original

Unitable®

BELT CONVEYOR

The MOST VERSATILE slider-bed belt conveyor on the market today. Over 4000 satisfied users say so.

The UNITABLE, with its integrated **POWER PAC Drive**, will save you money in initial cost, upkeep and performance. Full specifications upon request.

NEAR YOU is a distributor of **SPECIALTY Belt Conveyors, Slat Conveyors, Gravity Conveyors, Press Conveyors, "Unitrough" Belt Conveyors, Unipac Handlers (Portable Pilers), Reciprocating Lifts and Complete Package Handling Systems.**



CONVEYOR
Specialty
COMPANY, INC.

36 Newport Ave., North Quincy 71, Mass.

AD LITERATURE

Continued

How to combine accurate weighing with movement of materials in one operation is described in an illustrated catalog available from the W. C. Dillon & Co. The booklet covers Dillon's complete line of weight indicators.

Circle 38 on Reader Service Card

Mechanization of material handling systems is saving companies more than 50 percent of previous handling expenditures, according to literature available from the Clark Equipment Co. Case histories contained in the literature highlight this as one sure means of increasing profits.

Circle 32 on Reader Service Card

Details of an air-operated explosion-proof industrial truck are given in literature available from the Crescent Truck Co. Air for powering the drive unit and the hydraulic hoisting mechanism is said to be supplied from an outside compressor through a flexible rubber hose and tension reel to take up the slack hose.

Circle 131 on Reader Service Card

A catalog on the Brainard strapping system along with a new booklet describing the Utilikit portable strapping kit may be requested from the Brainard Steel Division. The company also will provide an analysis of your packing and shipping operations which is said to lead to improved efficiency and substantial savings.

Circle 22 on Reader Service Card

How to design your own conveyor installation is explained in detail in the Redi-Fab Catalog available from Barber Greene. The manufacturer maintains its Redi-Fab series meets the needs of two out of three permanent conveyor installations.

Circle 26 on Reader Service Card

Circle No. 135 on Reader Service Card



EXPLOSION PROOF

SUN OIL CO., MARCUS HOOK, PA.,
3000 lb. Air Palletier, equipped
with 12" side shifter, stacks pallet
loads in ship's hold. Models also
available in 2000 and 4000 lbs.

CRESCENT air operated PALLETIER

Air Palletier, another first developed through Crescent JOB ENGINEERING, eliminates the principal cause of explosions because there are no electrical devices...no motors, contactors, or resistors. The drive unit and hydraulically operated lift mechanism are powered by air motors. Air is supplied either from a compressor (located outside the danger zone) or from piped air when used within the plant. A spring-loaded reel carries sufficient hose length to provide 75 feet of operating radius. When piped air outlets are available, operating area can be increased up to 200 feet, or more.

Pricewise, Air Palletier costs considerably less than special type so-called "explosion proof" electric trucks.

For maximum safety—specify Crescent Air Palletier. Complete specification literature sent promptly upon request.

Our 36th Year

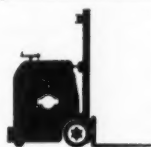
CRESCENT TRUCK COMPANY
Division of Barrett-Cravens Co.
1155 Willow Street
LEBANON, PENNSYLVANIA

CRESCENT

EXPLOSION PROOF

AIR PALLETIER

INDUSTRIAL TRUCKS FOR EVERY USE



AISLE-SAVER.
Stand-up Model.
Extremely
Maneuverable.
1000 to 4000 lbs.



**LOW HEAD-
ROOM MODEL.**
For highway truck
loading and
unloading.
2000 to 4000 lbs.



**HIGH-LIFT
PLATFORM.**
Telescopic—
4000 to 6000 lbs.
Non-telescopic—
4000 to 10,000 lbs.



LOAD CARRIER.
Heavy-Duty
utility truck.
4000 to 10,000 lbs.



TRACTORS.
For trailer towing.
For all trailer train
loads.



**LOW-LIFT
PLATFORM.**
For lifting and
moving skids.
1000 to 10,000 lbs.

Circle No. 131 on Reader Service Card for more information

MICHIGAN APPROVED CRANES

ANY SIZE
ANY
CAPACITY



Engineered with All
the MOST WANTED FEATURES

IMMEDIATE DELIVERY

MICHIGAN has a national reputation for *immediate delivery* on custom-engineered cranes of unequalled dependability, durability and low cost! Literally hundreds of letters in our files from industries like yours is your absolute assurance of unbelievably prompt installation of a Michigan Approved Crane *which meets your exact requirements*. No finer cranes have ever been built, because Michigan quality-controlled manufacturing is never sacrificed, even in the smallest detail, to the most rigorous delivery deadline!

SEND ME
YOUR NEW
CRANE
BOOKLET

Name _____
Address _____
City _____ State _____

WRITE FOR FREE LITERATURE TODAY!
MICHIGAN CRANE & CONVEYOR CO.
117 MCKINSTRY AVENUE • DETROIT 9, MICHIGAN

Circle No. 81 on Reader Service Card for more information

SHOCK RESISTING FLUID DRIVE

Power is transmitted through moving oil, protecting motor and drive mechanism from shock.

ANTI-FRICTION BEARINGS

Moving parts are mounted on ball or roller bearings, reducing wear from friction.

PUSH-BUTTON MAGNETIC CONTROLS

An all-important feature which protects motors against damage from overloads.

EXTRA-RIGID BRIDGE

Your assurance of the utmost in stability and safety, a plus Michigan feature.

LOWER HEAD ROOM

Lets you lift loads higher, allows more overhead space for stacking and storage.

AD LITERATURE

Continued

Special features and advantages of its worm drive electric hoist are explained in literature available from Electrolift, Inc.
Circle 42 on Reader Service Card

A new Facts Book available from the Buda Co. maintains it is possible for your own maintenance men to change the clutch on a Buda truck in no more than 30 minutes. Stripping the truck for service is said to take only seconds and preparing for overhaul is only a matter of minutes.

Circle 23 on Reader Service Card

A copy of bulletin C-1 may be requested from the American MonoRail Co. It fully covers the use of monorail cranes where space is limited and explains how to handle variable jobs with this type installation.
Circle No. 8 on Reader Service Card

The colorful Autoette brochure may be obtained from Autoette, Inc., covering its complete line of electric pick-up trucks for light duty carry-all service in and between plant buildings.

Circle 133 on Reader Service Card

Handling of odd-shaped castings can be speeded up in foundry operations through the use of Acco foundry hooks, described in literature available from the American Chain & Cable Co. The hooks have a wide mouth and a rounded point that lends itself to a wider variety of applications.

Circle No. 6 on Reader Service Card

Portability, Strength, Utility and Savings are among the features highlighted by Speedways Conveyors, Inc., in describing its aluminum gravity wheel conveyor.

Circle 106 on Reader Service Card

LORAIN CRANES

**handle 10,000,000 lbs.
of metal per month in this yard**

3 Lorain Cranes are on the go sixteen hours a day — the year 'round — at this large midwestern manufacturing plant. They report their Lorains (2 on rubber tires, shown below) handle more than 10,000,000 lbs. of raw and processed stock to feed production lines on schedule. Moves are many — and the rubber-tire cranes scoot all over the roadways of the large storage yard, sorting, selecting and lifting all types of materials from numerous stockpiles, loading and transporting them to factory, as well as performing extra-duty jobs that save time, equipment and money. The Lorains are fitted with magnets and slings to handle a wide variety of material sizes and shapes. The check-list at right is typical of the many ways Lorains save time and money at this plant.

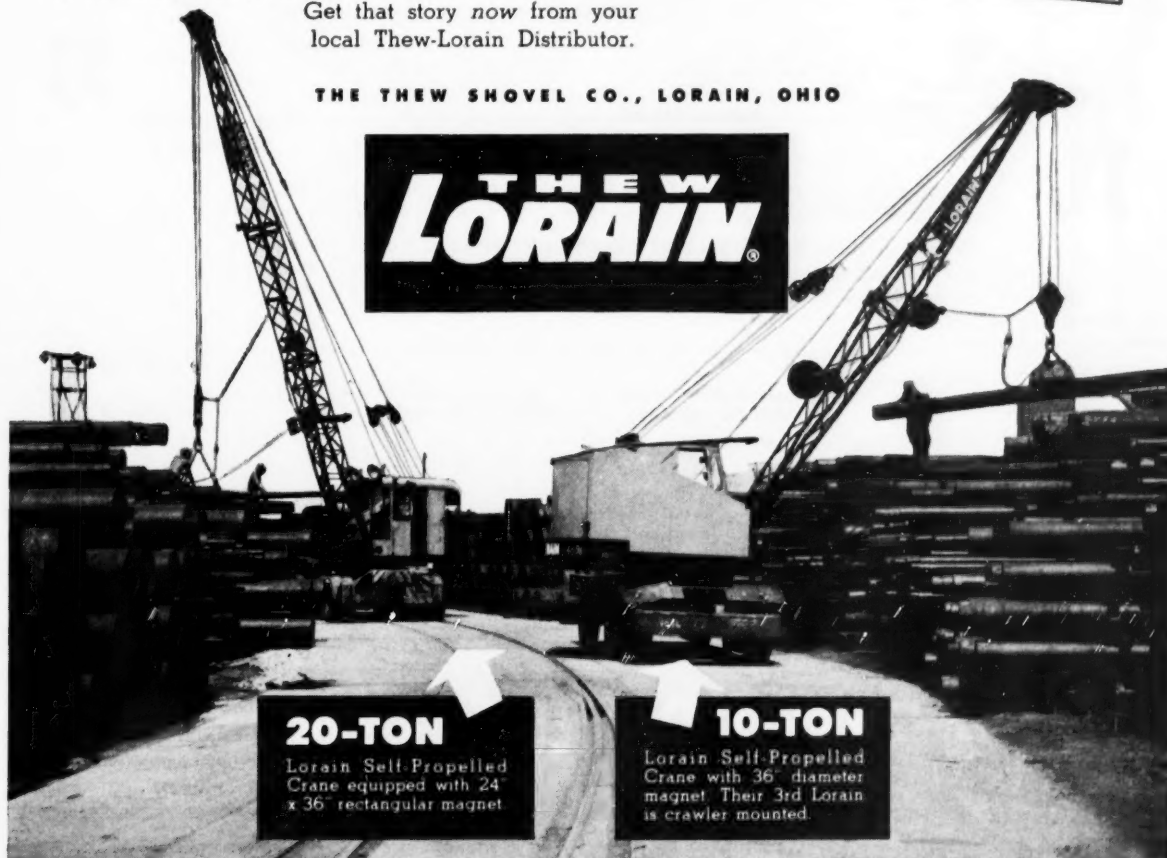
Want to save money in *your* plant, too? Then, check the Lorain Self-Propelled Crane story! See how rubber-tire mobility, choice of many lifting attachments, one-man control, long, far-reaching booms . . . plus Lorain quality features and full-line selection on crawler or rubber-tire mountings, from 6 to 45 tons capacity — will enable you to do more, faster, better, at lower cost with a Lorain.

Get that story *now* from your local Thew-Lorain Distributor.

LORAINS DO THESE JOBS — BETTER AND FASTER — at this plant!

X	Handle Raw Stock
X	Handle Semi-Finished Stock
X	Handle Scrap
X	Push and Tow Railroad Cars
X	Dump Tote Boxes
X	Lift 10 to 12-ton Loads
X	Travel up to 2 miles per day

THE THEW SHOVEL CO., LORAIN, OHIO



20-TON

Lorain Self-Propelled Crane equipped with 24" x 36" rectangular magnet

10-TON

Lorain Self-Propelled Crane with 36" diameter magnet. Their 3rd Lorain is crawler mounted.

Circle No. 118 on Reader Service Card for more information

MOTO-TRUC

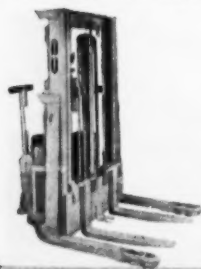
Service-ability



GOOD truck maintenance begins right in your own plant. The quick service features of MOTO-TRUC mean less down time . . . Less cost to you for repairs.

Get the complete facts on the truck that offers the utmost in trouble-free operation . . . and remember . . . THERE'S A MOTO-TRUC FOR EVERY PURPOSE. Send for Bulletin No. 53.

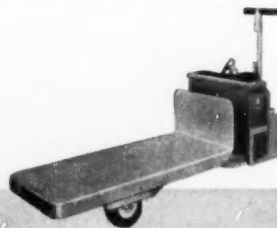
Hi-lift "Walkie" type
3000-4000 lbs. capacity



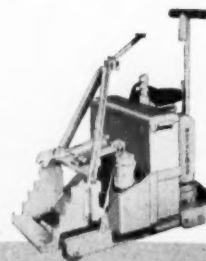
Pallet type "Walkie" truck
4000-6000 lbs. capacity



Platform "Walkie" type
4,000-10,000 lbs. capacity



Grip-All Tractor

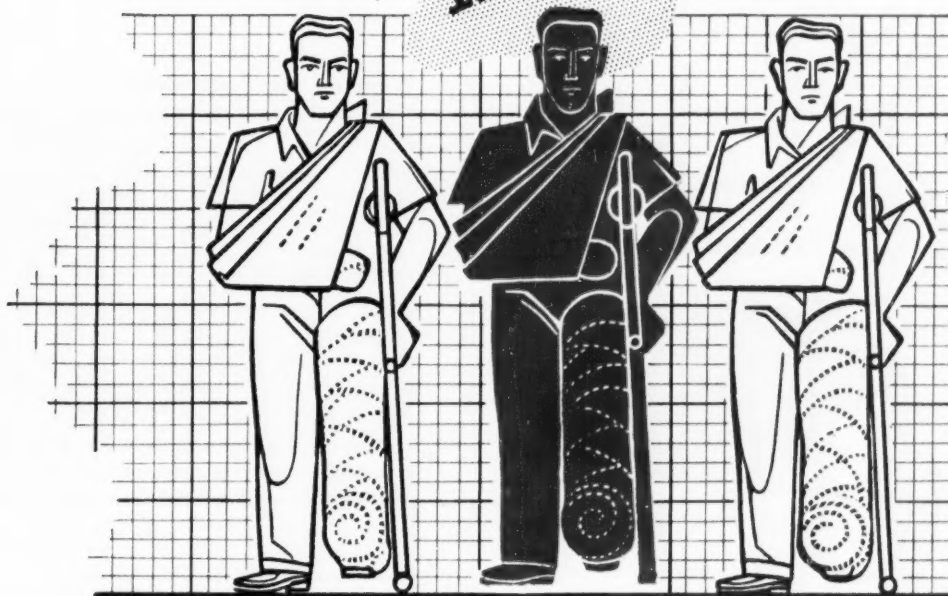


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Pallet . . . Platform . . . Hi-Lift Trucks
LARGEST EXCLUSIVE MANUFACTURER
OF "WALKIES"

Material Handling Accidents

AN INDUSTRY HEADACHE



**. . . One of Every 3 Industrial
Accidents Is Due to Poor Handling!**

The National Safety Council, in the latest edition of its Handbook of Accident Prevention for Business and Industry, reveals that approximately 35% of all on-the-job compensable injuries come from material handling. In other words, more than one of every three accidents occurred because someone did not use common sense in what could be the simple task of moving materials and products.

The Safety Council found that the primary causes of handling accidents were unsafe working habits such as improper lifting, carrying loads which were too heavy, etc. The figures showed that about one-half of

all handling accidents were the result of improper lifting . . . just the simple act of picking something up and setting it down.

In a study of more than 20,000 accidents in many different industries, safety engineers for Lumbermens Mutual Casualty Co., a member of the Kemper insurance group discovered that incorrect material handling methods accounted for 31% of the total. This, of course substantiates the report of the National Safety Council. Lumbermen's researchers found that the material handling accidents accounted for a greater percentage of the total accidents than did any other type of work injury.

A pie chart illustrating the distribution of causes of industrial accidents. The chart is divided into 14 segments, each representing a different category and its percentage of the total. The segments are: HANDLING OBJECTS (39%), SPRINGS AND CRUSHING INJURIES (23%), FALLS (7%), MISC. (18%), STRUCK BY OBJECTS (14%), FALLING OBJECTS (9%), STOPPED OR REVERSED (2%), TRANSMISSION (2%), POINT OF OPERATION - OTHER (4%), POINT OF OPERATION - WOLDS (8%), MACHINERY (14%), OTHER HAND TOOLS (5%), KNIFE (5%), and PRINTER (2%).

Cause of Accident	Percentage
HANDLING OBJECTS	39%
SPRINGS AND CRUSHING INJURIES	23%
FALLS	7%
MISC.	18%
STRUCK BY OBJECTS	14%
FALLING OBJECTS	9%
STOPPED OR REVERSED	2%
TRANSMISSION	2%
POINT OF OPERATION - OTHER	4%
POINT OF OPERATION - WOLDS	8%
MACHINERY	14%
OTHER HAND TOOLS	5%
KNIFE	5%
PRINTER	2%



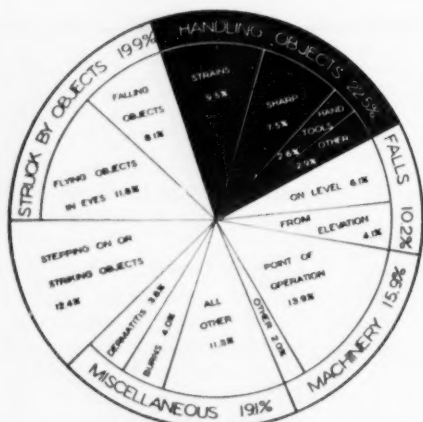
What Do Accidents Cost?

Add to the cost of back strains and hernias, the compensation payments for accidents resulting in crushed hands, mashed toes, falls, over-exertion from physical handling of materials and you have a major item of expense. It must be reduced.

1. Rubber Goods Industry



2. Furniture Manufacturing Industry



3. Radio Manufacturing

* Courtesy, Lumbermen's Mutual Casualty Co.

	PLANT A	PLANT B
Man Hours Worked	483,000	1,331,000
Back Strain Costs	\$2,500	\$6,757
Cost per \$100 Payroll	\$.2465	\$.2320
Hernia Costs	\$3,058	\$5,474
Cost per \$100	\$.3016	\$.1880

If we were to assume that each of the two plants had a monthly payroll of \$100,000., we would find that Plant A would be paying out \$246. per month in compensation for back strains and \$301.00 for hernias. Plant B would be paying out \$232.00 per month in compensation for accidents causing back strains, and \$188. per month in compensation for hernias.

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Continued

The lesson is startlingly clear . . . **whatever the cost of a piece of material handling equipment, it will always be low in comparison to the cost of the injuries which it might prevent.** Economy cannot be seriously considered as a reason for neglecting to purchase proper material handling equipment to replace age-old manual, antiquated methods. The truth is, that when causes and costs of accidents are studied, it is economically impossible not to invest in correct mechanical handling equipment.

New Jersey
\$336 (H)
\$301 (R)

Minnesota
\$347 (H)
\$227 (R)

Wisconsin
\$178 (H)
\$134 (R)

Illinois
\$169 (H)
\$165 (R)

Pennsylvania
\$176 (H)
\$208 (R)

BACK
HERNIA

The average cost for back and hernia injury in five representative states is extremely high—high enough to warrant the purchase of a considerable amount of mechanical handling equipment to eliminate the need for physical handling. But the cost of some of the above-average injuries is fantastic. One Minnesota manufacturer, in 1948 paid compensation benefits to a worker with a back injury for 960 days, doling out a whopping \$3,509 in compensation and medical payments. Another back injury in Minnesota dragged on for 1502 days—more than four years! That one cost \$5,649 in compensation and medical payments before it was closed. In the same state, a laborer in a packing house came up with a sacroiliac sprain from wrestling with heavy beef carcasses: a total of \$7,063 was spent on compensation and medical costs for him. Another example of the possible cost of a slow-healing back injury is one New Jersey accident: a single back injury reported in that state, resulting in a permanent total disability, cost the employer the staggering total of \$12,803!

A pie chart illustrating the causes of occupational accidents and injuries. The chart is divided into 18 segments, each representing a different cause and its percentage of the total. The segments are arranged in a clockwise direction starting from the top.

Cause	Percentage
Handling Objects	37%
Not 5%	5%
Stepping on or over objects	17%
Struck by objects	21%
Falls	16%
Slipping	6%
Wcs	4%
Struck by objects in area	5%
Rolling objects	12%
Walking into objects	6%
Nails	3%
Sharp objects	8%
Point of operation	5%
Stairs	5%
Tools & parts	5%
Caught in, under or between	6%
Lifting	21%
Other	1%
Tripping	2%
From ladders & stairs	2%
From trucks & platforms	0%

[illegible][illegible]

* Courtesy, Lumbermen's Mutual Casualty Co.

R for Preventing Handling Accidents

Here, given for the first time in one publication, is a comprehensive prescription of rules and suggestions for safety in the use of material handling equipment.

INHERENT IN ANY IMPROVEMENT of material handling technique is improvement in over-all safety. But since better handling operations very often involve increased mechanization—much of it with powered equipment—safety becomes an important consideration in the design, construction, installation and operation of the material handling equipment itself.

Designs of the latest handling equipment include many built-in safety features. If these machines are used strictly in accordance with manufacturers' specifications, with personnel fully trained in the rudiments of safety, they are as safe as machines can be. And early models which may still be in operation can be fitted with modern safety devices to bring them right up to date in that respect.

Although maintenance of handling equipment will largely be left for other, more intense discussion, it cannot be ignored here because it is a major factor in the safe operation of any kind of mechanical equipment.

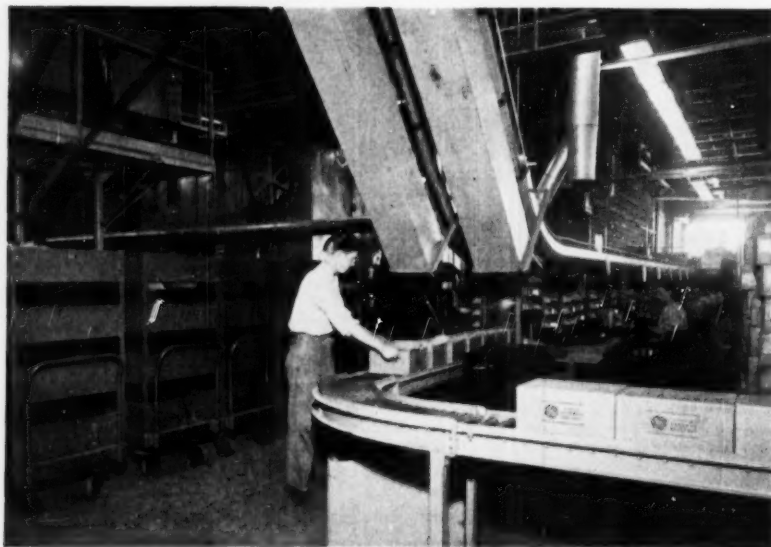
Principles of safe practices can be illustrated with discussions centered about a few major classes of material handling equipment. What applies to them will, of course, be significant in a relative degree to all other types of handling equipment.

CONVEYORS:

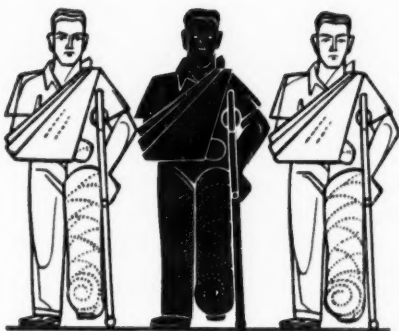
1. Design Safety Features

Full protection must be provided around all drive mechanisms of conveyors likely to be exposed to workers. Pulleys, sprockets, sheaves, drums, gears, drive chains and the like should be guarded so that they cannot catch clothing or parts of the body. Guards may be expanded metal, perforated or solid sheet, or wire mesh secured to the floor or frame of the machine. Metal should be free from burrs and sharp edges.

If such parts are unguarded because they are located in areas used only for maintenance, provision



GUARD of sheet metal protects worker directly under inclined overhead trolley conveyor. Other safety guards are along chains and trolleys where conveyor passes at low elevation before women operators.



should be made to stop and lock equipment so that it cannot be accidentally started.

Guard against mountings with sharp edges or pinch points.

Where bearings are inaccessible or in dangerous positions, see that lubrication can be piped to them from safe locations.

Be sure that adjustments to drives and take-ups can be made easily and safely. If adjustments are required while equipment is operating, guards must be provided to protect maintenance personnel from moving parts.

Anti-backup and anti-runaway stops should be incorporated in all sections where personnel could be endangered in the event of a break in chain, belting or cable.

Ascertain that load brakes are provided for over-load cut-out protection.

Keep counterweights on chains or cables enclosed. If vertically hinged sections of chutes, gravity roller,

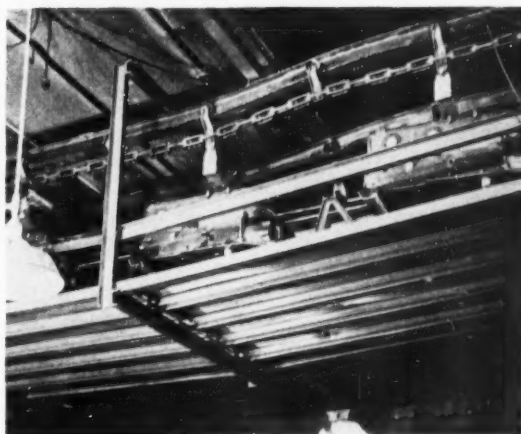
belt or other types of conveyor are to be manually raised, they should be designed so that effort of between three and five pounds is required.

Guard rails should be installed along a conveyor except where loading, unloading or transfer activities would be obstructed.

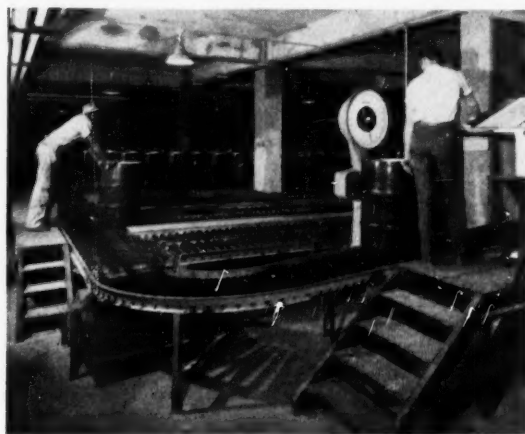
Interlock conveyors so that jamming cannot occur when one has been stopped or is blocked with loads.

Be sure transfer sections from one conveyor to another are properly designed to eliminate possibilities of pinch points and dangerous free materials.

Particularly for portable conveyors, make sure supports are substantial enough to hold maximum rated loads without tipping.



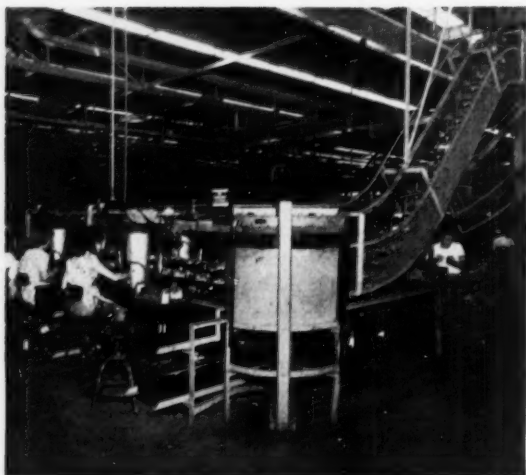
PROTECTION to men and materials below is provided under heavy product conveyor line by platform constructed of strong steel shapes.



SAFETY TREAD platforms and stairways secure footing for operators working with conveyors which handle 600 lb. drums through weighing and storing.



LIMIT SWITCH on roller conveyor prevents pileups in feed from inclined belt. When roller is held down predetermined period, belt motor is stopped.



SPECIAL PROTECTIVE guard at curve of conveyor protects pedestrians and vehicles. Wire mesh side panels and solid sheet metal bottom guard conveyor.

Mechanical equipment, in general, must not be loaded beyond rated capacity.

2. Safe Installation

Prime considerations in the installation of conveyors are clearances and accessibility. Be sure there is adequate space for maintenance, allow clearances and head room for cross-overs, aisles and other passages. Guard these points thoroughly against the danger of a falling object.

Clearly define all passages with floor markings, signs, lights, etc. Survey all personnel and mobile equipment (plus maximum load heights) likely to pass under loaded conveyors to be sure there will be fully safe head room.

Clearances for a man to walk between conveyors and walls should, wherever possible, be based upon the largest load conveyed.

Consider all these factors in connection with tunnels, pits, hoppers and chutes. Wherever there are wall or floor openings, be sure they are well shielded.

If conveyors which must be serviced are high, provide guarded catwalks. For enclosed conveyors, see that adequate inspection doors and peep holes are provided at all crucial points.

Be sure there is unobstructed visibility so that oncoming loads can always be seen.

Have stop and start stations marked clearly, easily accessible, and located where a clear view of the entire conveyor length is afforded. Install a number of push-button stop stations at all critical points.

Insist upon electric ground wires, especially on portable conveyors and systems operating outdoors or in damp locations. Insist upon heavy duty, high quality electrical equipment.

TRAY SUSPENDED below overhead live roller conveyor prevents contents of boxes from falling on packers on floor below in paper manufacturing plant.

Accident Prevention . . . Con't.

When installing a conveyor, don't start using it for production until it has been formally turned over to you by the manufacturer. Systems must be run so that bugs can be taken out. Clearances may need further adjustment.

3. Inspection and Maintenance

Maintain scheduled services for:

Inspection and lubrication of all bearings and moving parts.

Take-up inspection and adjustment

Examination of all cottered connections, pins, couplings and clutches

Replace immediately parts which show wear.

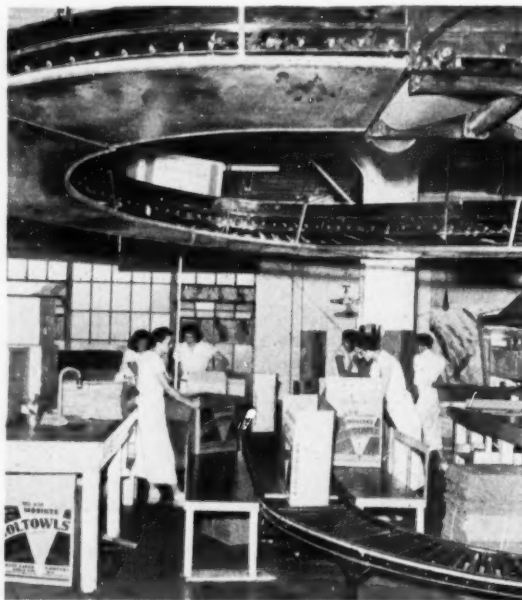
Don't permit anyone except regular maintenance men to make repairs. Require that the conveyor be stopped, the normal starting buttons locked out, while they are working on it. When a conveyor is shut down for servicing, be sure that another, moving conveyor cannot endanger the workman.

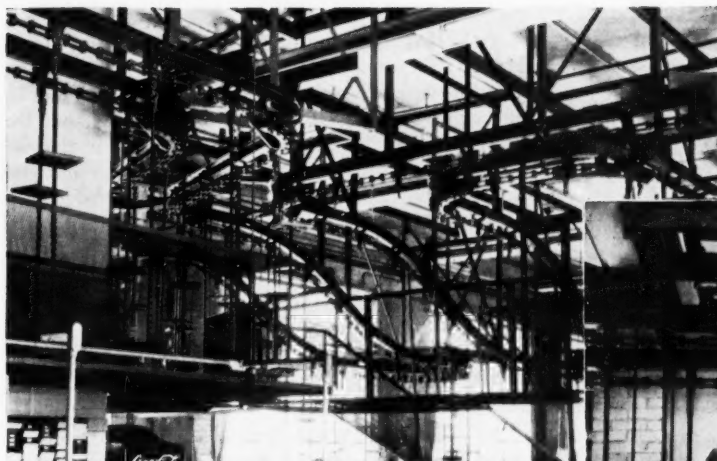
If overload cut-outs are continually operating or shear pins frequently shearing, check the system with a dynamometer to see if it is being overloaded. Call on the manufacturer of the equipment to ascertain the cause of persistent jamming. If the design is light, have it heaved up before trouble starts.

4. Operation

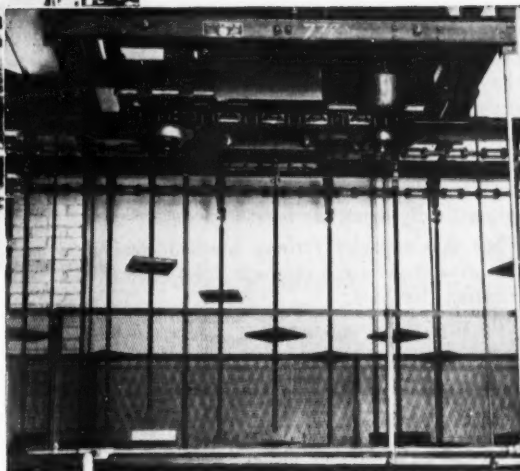
In addition to the above aspects, with which they should be thoroughly familiar, operating personnel must be specifically instructed:

- (a) to obey rated-load signs and regulations
- (b) Not to step or ride upon any conveyor





TUBULAR parts which might fall from special carriers could tumble or roll to floor below, so high wire barrier was erected wherever protection was needed, as over aisle intersection. Close-up right shows caterpillar drive installed out of way but accessible for service.



- (c) To be careful in loading conveyors to see that the hook-up is secure, that piled materials are stacked securely, and that parts are properly placed when special devices are provided.

Authorize designated personnel to operate given conveyors just as you would for machine tools. Keep others from starting the system. Entrust speed variations in conveyor lines only to those supervisors who understand the effect upon the whole system.

Have it thoroughly understood that in case of overload cut-out, the operator should locate the jam and use lockouts before starting or servicing.

Safety Tips for Some Conveyor Types

Slat Conveyors—use a smooth cover under slats, where there is space between them, to protect against shearing hazards.

Bucket Elevators—enclose totally where possible.

Chain Conveyors—hand rails, smooth sides and guard plates will protect hands, feet and clothing.

Gravity Conveyors—stops are needed at open ends.

Live Roller Conveyors—try to eliminate all pinch points.

Overhead Trolleys—for protection underneath, use substantial guards, with sides.

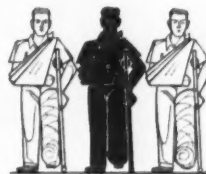
Screw Conveyors—when possible, use solid covers.

Belt Conveyors—where trippers have operators' platforms, be sure they protect the operator fully from slipping or falling, that contact between man and moving parts is impossible.

Pneumatic Conveyors—doors to pressure chambers must be secured against accidental opening while pressure is on; bins or silos need full-bin indicators and/or controls.

Flight Conveyors—guard rails are essential around terminals and alongside conveyors not completely housed and in locations accessible to operating areas.

For cooperation and pictures in the preparation of the foregoing section, FLOW thanks The Alvey-Ferguson Co.; The Jervis B. Webb Co.; Hapman Conveyors, Inc.; Standard Conveyor Co.; and the Conveyor Equipment Manufacturers Association.



OVERHEAD EQUIPMENT

1. Design Safety Features

Be sure that all motor, controller and switch frames are grounded, and that electrical equipment is fully protected against dirt, dust and the elements (if outdoors).

On overhead traveling cranes, see that there is in each cage or cab an automatic cut-off, for all motors, that will function in the event of power failure. This should not permit a motor to be re-started until the

(More on next page)

Accident Prevention . . . Con't.

controller has been set in the "off" position, or unless a reset switch or button has been operated. Controllers for all types of overhead equipment must be of a type (button, switch, or lever) that prevents any inadvertent starting of the equipment. In a cage or cab, a switch within easy reach of the operator will allow him to disconnect the power supply immediately whenever it might be required.

Require limit switches on all electric hoists and cranes to prevent overhoisting. Electric brakes employed with limit switches avoid excessive "drift," automatically bring the hoist to a quick stop.

See that capacity ratings, marked clearly on each side of a crane—and on each hoist—are clearly legible from the floor.

Be sure the sound warning device on a crane can be heard above the maximum noise level of the plant.

2. Inspection and Maintenance

Operator reports of crane inspection are required as frequently as every shift by many plants. They are essential to safety. Hoists need comparable attention. The importance of following manufacturers' instructions for inspection and maintenance cannot be over-

stressed. Principal points upon which operators should check, act, and report follow.

(a) **Hoisting chain, rope or cable and hook blocks:** Report any damaged links, broken strands, chipped sheave wheels, damaged spokes or hubs, or any signs of wear. If chain is stretched so that the length exceeds five percent of the original, it must be discarded. (Chains should be calipered when new and a record kept). See that rope is fully lubricated; watch fittings especially. Repair or replace any damaged guards.

(b) **Drums:** Sheaves and drums badly scored or with rough edges on grooves should be smoothed or replaced. When grooves have become worn deeper than the cable diameter, discard or regroove the drum. Replace equipment with cracked or broken flanges, rims, spokes or hubs.

(c) **Brakes:** Watch for signs of wear. Drums or disks must be machined if they are not smooth.

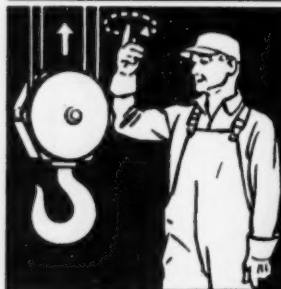
(d) **Bridge:** Check alignment—squealing wheels indicate the bridge is out-of-true.

(e) **Trolley or Runway:** Inspect for broken, cracked or chipped rails.

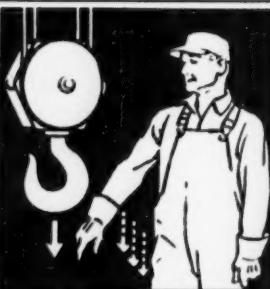
(f) **Limit Switches:** These should be tested at the beginning of each shift, as follows:

Move the crane into a clear area where no damage can be done if the hook block should fail. Run the hoist up to just below where the limit stop normally operates and put the controller in the off position. Proceed cautiously

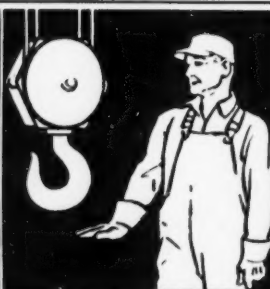
Standard Crane Hand Signals



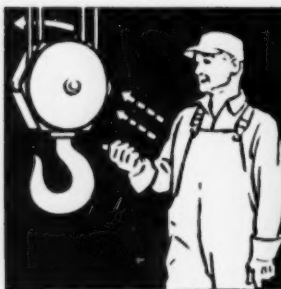
HOIST: Forearm Vertical. Make Small Horizontal Circle with Hand.



LOWER: Arm Extended, Hand Below Hip; Wave Forearm Downward.



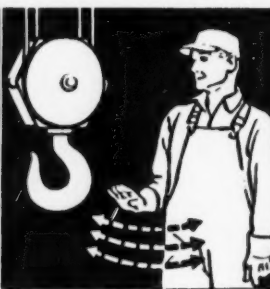
STOP: Arm Extended, Hand Level with Hip; Hold Position Rigidly.



RACK: Hand Below Hip, Fingers Closed, Thumb Horizontal; Jerk Hand in Direction of Racking.



TRAVEL: Forearm Vertical, Hand Open; Wave Forearm in Direction of Travel.



EMERGENCY STOP: Arm Extended, Hand Level with Hip; Wave Quickly Right and Left.

1. Do not move the load or the crane unless you understand the floor signal clearly.

2. Be careful that the load does not swing to injure your hook-on man or other floormen; make certain they are in the clear.

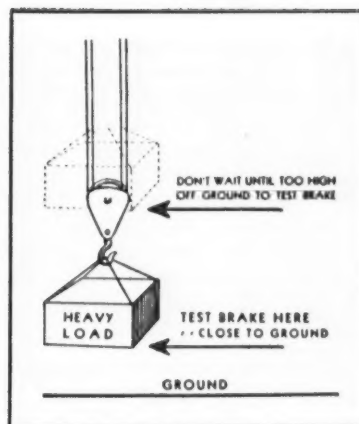
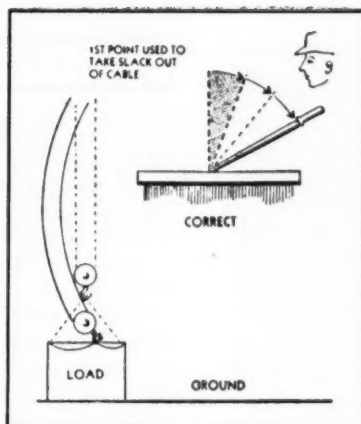
3. When raising or lowering the load, see that it will safely clear adjacent stockpiles or machinery.

4. Never pick up a load greater than the capacity of your crane. In case of doubt, call your foreman.

5. Never do anything that is not safe.

6. Co-operate with your hook-on or floorman. You and he are a team handling a valuable piece of equipment.—Never let it become a hazard.

TO AVOID WHIPPING, straining cable when raising heavy load, first take slack out of hoisting cable. When load has been lifted few inches, test brake to be certain it will hold.



into the limit stop. If the limit stop is operating properly, the hoist will stop and the controller should be in the off position. During the test, watch the hook block closely. If it does not stop within proper clearance between hook and hoisting drum, stop the hoist motor instantly by the controller. Call for qualified personnel to examine the limit switch.

If the limit switch operates satisfactorily, lower the hook about half way to the ground. Then raise the hoist at full speed into the hook block. If there is any inaccuracy in stopping, the limit switch needs attention by qualified personnel. Excessive drift may be caused by out-of-adjustment hoist brake or improper operation of the stop. Be sure weights of weight-operated stops always hang in proper position.

(g) Controllers: Report to electrician electrical or mechanical defects that may make operation faulty.

(h) Gears: Inspect gears by sight and sound; if grinding or squealing noises develop, stop equipment immediately because there may be insufficient lubrication or foreign material in gear teeth. Regularly lubricate as prescribed in the manufacturer's maintenance manual.

(i) Guards: Repair or replace safety guards, footwalks and ladders which are bent, broken or lost.

(j) End Stops: Assure that end stops on trolley or bumpers on bridge are secure and undamaged.

(k) Overload Tripper: The cause of frequent tripping of an overload cut-out relay should be determined and corrected immediately.

(l) Mechanical Parts: Any loose parts—rivets, covers, guards, etc.—should be tightened securely.

(m) Riding: Bumpy riding may indicate worn unsafe wheels that need replacement.

(n) Collector Shoes: Examine, and report those worn, pitted, loose, and broken to electrician.

(o) Lights: Replace burned out or broken signal or warning lights.

(p) Lubrication: Check for overflowing on rails, dirty cups, etc.

(q) Couplings or Bearings: Repair or replace when loose or worn.

(r) Hooks: Watch for fractures or flaws. (Magnaflex testing is recommended at frequent intervals.)

3. Operation

Above all, a hoist or crane must not be overloaded.

The operator must be thoroughly familiar with every part of it, its care (as outlined above) and the standard crane signals illustrated and described separately. The following tips on crane operation are offered for operators in addition to specific instructions provided by manufacturers of cranes and controllers.

Hoisting

1. When ready to raise a heavy load, use the first point of the controller to take slack out of cable to avoid whipping and straining. When cable is taut, advance the controller slowly until the load starts to raise; then move the controller point by point until the full "on" point is reached.

Be sure the hoist brake will hold a heavy load. It is wise to check it after the load has been lifted a few inches. If the brake does not hold, lower the load to the ground immediately, and call the foreman or repairman to adjust or repair it.

2. When possible, hoist above the landing point and lower into position. When a heavy load is suspended from the hook, off the ground, bear in mind that the first two hoisting points of the controller give reduced motor-pull for smooth starting of light loads or empty hooks. If the load is to be raised above its suspended position, remember which controller point was required to make the motor start when the load was first raised off the ground, and go to that point quickly. Otherwise the hook may lower due to the weight of the load. For this reason, it is desirable to inch a heavy load down rather than up.

Lowering

1. When lowering a load, reduce speed as the landing point is neared by returning the controller toward the "off" position. To set a load down carefully, it is advisable to stop the motor when it is just a few inches from the ground; then restart the motor and use the first point of the controller—or first point and off, repeated as needed—to lower the remaining distance.

2. When a fractional movement is required to spot

a load, move the controller to first point lower, and pause only an instant before returning to the off position. Avoid excessively rapid movements of the controller between these two points. Too fast operation will not allow time for the magnetism in the electric holding brake to build up to the releasing point; too slow operation may allow the load to lower too fast.

In lowering, should an operator detect what seems to be any over-speeding at any point, with any type of load—he must report the condition at once to the foreman. The crane should not be used until the condition has been corrected.

The previous section was prepared with the cooperation of American Chain & Cable Co., Wright Hoist Div.; The Electric Controller & Mfg. Co., Harnischfeger Corp.; Michigan Crane & Conveyor Co.; The American Society of Mechanical Engineers, American Standards Assoc.; and the Electric Overhead Crane Institute.



INDUSTRIAL TRUCKS

Text for this section provided by . . .

W. A. Meddick,

Vice President, Elwell-Parker Electric Co.

It has been the experience of many companies which have purchased industrial trucks that, because of haphazard operation, accidents and damages have skyrocketed so that the economies inherent in such equipment have not been realized.

It is the purpose of this report to suggest positive steps to eliminate unsafe factors and thus gain the advantages of industrial truck operation which have been designed by the manufacturers of this equipment.

Safety Begins With The Operator

The first step in a comprehensive safety program must begin with the operators. It should be stated at the outset that it makes no difference whether a company uses one or 1000 industrial trucks—driver training is a must.

After all, one truck in a small plant can do just as much damage (often more in proportion) than a fleet of trucks in a large plant.

If yours is a large plant using a fleet of industrial trucks, it may be that your best bet is to institute a driver training school in which a complete course in best operating methods is taught. Some of this country's largest companies have conducted such schools with tremendous success.

One firm, which has had such a program in operation for some time, prescribes a total of 16 hours training—a combination of class work and driving instruction—for operators who have had some experi-

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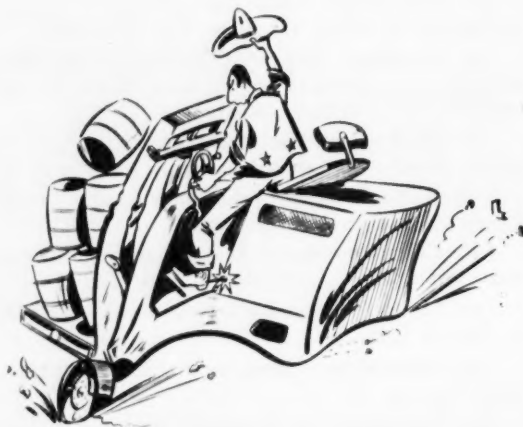
ence. For inexperienced operators, a combination course totaling at least 32 hours is required. They feel, that in either case, sessions should run consecutively on a full-day basis.

Here's how another user program operates: new employees get a briefing from the instructor and then start on a primary obstacle course. Trainees take trucks through an aisle with only an inch clearance and are taught how to handle a vehicle in intersecting aisles. They are also instructed in spotting and picking up loads. Finally, each student is instructed in maintenance procedures with training films and with actual models. This training course is designed for everyone; even supervisors work with the company's fork trucks so that everyone gets the same thorough education. Maintenance is stressed because it is felt that keeping a truck in good shape can prevent many an accident. By requiring the operator to feel responsible for at least a part of effective maintenance, the entire overall safety program is enhanced.

Many firms feel that the more responsibility given to each truck operator, the more effective the overall safety campaign. For example, some companies make the driver responsible for all accidents, stating that speed must be sacrificed for absolute control and ability to bring the truck to an immediate stop when required. The thinking is the same as many traffic laws which state that the driver must have his car in control at all times and is responsible even though the car in front of him stops short.

A good example of strict driver rules for industrial truck operators is the program in effect at a large Midwest plant. Here are a few of their rules.

1. Drivers must stop within eight feet in open aisles or roadways and within three feet in narrow aisles near machinery and in congested areas. A distance of at least ten feet must be maintained between moving vehicles. Extreme care must be





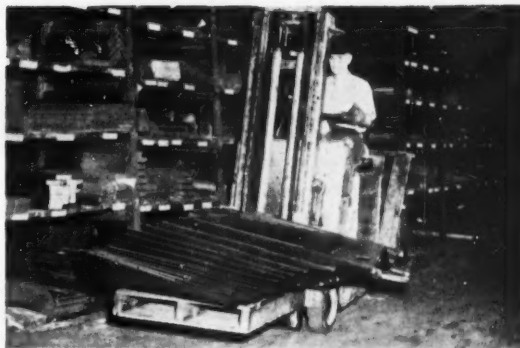
- exercised where floors are wet or greasy.
2. Trucks must be completely stopped, and the horn sounded before: (a) entering doors of all buildings, (b) approaching blind corners, (c) turning into or crossing main aisles, or (d) entering ramps.
 3. Vehicles must be stopped and started without skidding the wheels.
 4. Drivers must learn the capacity of their trucks and lift no loads above that capacity.
 5. Disabled trucks must be towed by another vehicle; they must not be pushed.

The program is far more inclusive than is shown, but the extent is evident. It is felt that its strictness has paid off with decreases in accidents, damage, compensation claims, and repairs.

Basic rules have been set forth by all manufacturers of industrial trucks. In individual plants certain factors may alter or increase stress on the existing rules, but the following may be considered as "musts":

1. Don't allow loads to obstruct the operator's view. Normally, loads should be such that this does not happen. If, in extreme cases, over-size loads are unavoidable, the truck should be moved backwards.
2. Loads should never be picked up with forks off-center. This bad practice can result in spilled loads, damage to truck or surrounding areas, injury to op-

LOADS PILED TOO HIGH prevent normal vision, invite accidents, if carried in normal direction. It's far better to stop, turn around, and proceed in reverse.



OFF-CENTER loads endanger materials, operators, equipment and other workers. It is wise to secure and center loads on pallets or skids before starting travel.

erators or other workers. If a load is set down temporarily, the same care in picking it up again should be exercised. By the same token, loads should be prepared so that the weight of a load unit itself is not appreciably off center. Loose loads should be carried in proper containers.

3. Personnel other than the driver himself should never operate or ride on an industrial truck. Unauthorized persons riding on forks or platforms, sitting on the battery or engine compartment, crowding the operator, or hanging onto the truck can only invite compensation claims. Practical jokes can lead to serious injuries. Also, except under extreme cases or when closely supervised, a fork or platform truck should never be used to hoist personnel to reach the top of piles for maintenance operations, or in general, to reach high inaccessible areas.

4. Travel areas for industrial trucks should be kept free of ruts, obstacles, grease, oil, pits, etc. Such factors do nothing more than increase accidents. Truck operators should be on the lookout for such unsafe operating conditions and report immediately.

INVITATION TO INJURY offered when forks are used for elevator. Besides, an expensive piece of equipment is tied up when ladder would serve to reach parts bin.



"Do's" and "Don't's" for Fork Truck Drivers



Accident Prevention . . . Con't.

5. Loads must be transported as low as possible. The higher the load is carried the more difficult it is to control. Loads carried high can't help but obstruct the operator's view, limit maneuverability and reduce truck stability.

6. Doorways, corners, and other travelways should be outlined with bright colors or hash marks. Pipes, machinery, and other obstructions should be outlined in contrasting colors so that drivers can spot them immediately. Also, trucks themselves should be painted in bright colors so they may be seen by other personnel. If a driver is not sure of sufficient clearances, he should stop his truck and make sure—not guess.

7. At the first sign that a truck is not operating at 100 percent efficiency, in any way at all, the driver should report it to the maintenance department or to authorized personnel. If equipment failures are caught in time, many accidents can be prevented.

8. Drivers should avoid making quick or jerky stops. The momentum of the load may play tricks on the operator. Special care should be taken with stops when a load is elevated for tying or stacking.

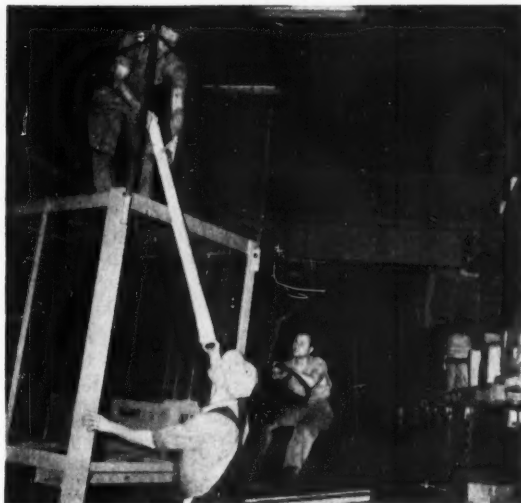
9. If the truck has a tilting device, it should be used. By tilting the upright toward the operator, the weight of the load is brought back slightly and balance is improved. This slight tilt of eight to ten degrees will help avoid the spilling of a load when rounding corners or if a quick stop is necessary.

10. Railroad tracks should always be crossed diagonally, never at right angles.

11. The truck should be kept clean at all times. Dirt and rubbish around it make footing uncertain and may cause trouble if obstructions lodge somewhere in the mechanism.

12. Traffic rules must always be observed. Opera-

CARE AND CAUTION are required for high tying. A load safety rack and overhead guard for driver will minimize danger from accidents like this.



SAFETY PLATFORM securely fastened to trucks eliminates much risk when truck is used for special applications such as maintenance of lights & motors.

tors should keep to the right and not travel in the wrong direction in one-way lanes.

13. No driver should operate his truck with wet or greasy hands. If necessary, a towel or wiping rag can be kept where it may be easily reached to dry hands before taking hold of the controls.

14. Operators must slow down before opening doors by remote control, and be prepared to stop safely if it is found that the automatic mechanism is out of order or the way is not clear beyond the door.

15. Fire prevention rules must constantly be observed. If a truck carries a fire extinguisher, it should always be in good condition, the driver must be trained in its use.

16. Drivers should avoid sudden stops, starts, and changes in pace when transporting bulk materials, especially liquids. If baffle rings are available to prevent slopping, they ought to be used.

17. Swinging doors should be approached squarely and in the center to avoid breaking hinges.

18. The horn should be used but not abused. The driver must signal when approaching intersecting aisles, blind corners, or swinging doors. Several short blasts are better than one long blast. A driver should signal and slow down when approaching a pedestrian who is walking away from him. However, startling others with loud blasts should be avoided; the horn can be a hazard if used improperly. The sounding of the horn does not give the driver the right of way.

19. Trucks must be parked safely, and not where they will block aisles, platforms, or doorways.

20. Operators should look before they start, and be sure that no person or object is in the path of the truck, not only at leg level but also at head level. Particular care must be taken before backing out from a load.

21. Every collision should be reported to authorized personnel, even if no damage is done.

Accident Prevention . . . Con't.

22. Crowds should be avoided; likewise areas congested during shift changes and lunch periods.

23. If more than one truck is operating in the same area, the one following must stay at least 15 feet behind. Trucks must never travel two abreast.

24. Hoists must be handled carefully and not raised or lowered when traveling. Hands should be kept off hoist tracks.

25. Inflammable liquids or acids should never be transported except in approved containers.

26. Trucks should never be driven in the dark; runways and aisles which are poorly lighted should be promptly reported.

27. When trucks ride on elevators, all power should be shut off and brakes set.

28. Most important—The driver of an industrial truck should know his job thoroughly. He must understand the function of the truck and its limitations. He must realize that his ability to handle his truck can mean immense economies, or it can mean serious damage and/or injuries. He must be constantly alert while operating his truck, not distracted by other personnel, loud noises, other equipment or operations. He should not eat or drink while operating his vehicle. He must be thoroughly and constantly reminded that he has in his hands not only the responsibility of many thousands of dollars but also the lives of himself and his fellow employees.

Photos and sketches on fork truck safety provided by Clark Equipment Co.—from booklet and movie, "Safety Saves"—and by Elwell-Parker Electric Co.



ELEVATORS and HOISTWAYS

PROPERLY USED, inspected and maintained, elevators are among the safest of transportation equipment and other workers. It is wise to secure and devices. Treated improperly, however, they can be sources of real danger.

Statistics show that the percentage of serious accidents has been considerably greater in connection with freight elevators than it has with passenger elevators. Possibly, greater stress has, in the past, been placed on the protection of passengers than on the protection of employees, goods and materials. Since a large percentage of freight accidents are either serious or fatal, concentration on freight elevator safety has been an important project of elevator manufacturers.

Also, there has been a tendency to discount the accident potential in dumbwaiters. Although possi-



OVERLOADING an elevator can be avoided, in one method, by installing doors at both ends so that trucks can load from each side without entering car.

bilities are more remote on them than on elevators, the accompanying chart illustrates that safety precautions and regulations are really important. What is said about elevator safety applies, then, to a relative degree, in the operation dumbwaiters—and other, similar lifting equipment.

In order of frequency, accidents have occurred from the following causes:

- Use of emergency keys or other devices to open hoistway door from hall side
- Lack of proper safety devices
- Defective or improperly installed safety devices
- Manipulation of safety devices by personnel
- prohibition by code, or door

Although the prohibition of emergency door keys has resulted in marked safety improvement, there are still a large number of elevators equipped with emergency door unlocking devices that constitute a hazard if used for other than emergency purposes.

Improper use of safety switches also contributes materially to the accident rate. Although these switches are supplied by the manufacturer with break-glass covers, glasses are soon broken or removed, and switches are used to operate the elevator with the hoistway door open. Many codes and jurisdictions are banning these switches.

"Ropes" Are Principal Safety Devices

The principal safety feature of an elevator are the steel cables or "ropes" themselves from which the car is suspended. A safety factor of 8 to 12 is required by law.

Car Safeties

There are on a modern elevator several specific safety devices such as the car safety grip. This device is designed to prevent the free fall of an elevator in the event that the rope does break.

Elevators using ropes are required by code to be equipped with safety grip devices to stop cars when over-speeding in either direction from any cause. These "safeties", as they are commonly called, are actuated by the governor located in the machine room, generally at the top of the shaft. The motion of the car is transmitted to the governor by the governor rope, which is fastened to the car by the releasing carrier. If the car overspeeds, a clutching device on the governor automatically grips and stops the gov-

MODERN elevator sketched to show safety features and devices requiring regular, systematic maintenance.

ernor rope. Because the car, at that instant, is still descending, the governor rope is freed from the releasing carrier, and the pull of the rope operates the safety which grips the guide rails and stops the car. At the same time all power is shut off and the brake on the elevator motor automatically set.

The safeties in high speed elevators are actuated more quickly by somewhat different devices. Using the inertia of the governing system instead of actual governor speed, the safeties are applied instantaneously, after a break or any other electrical or mechanical failure, and before the elevator has accelerated to a high speed at which the impact of setting the safeties might severely damage the safeties and guide rail.

Buffers

Another device designed to prevent damage in case the car or counterweight descends into the pit by accident are the buffers located in the pit under the car and attached to the underside of the counterweight. Buffers are designed to bring the car and counter-weight to a gradual and safe stop.

Door Interlocks

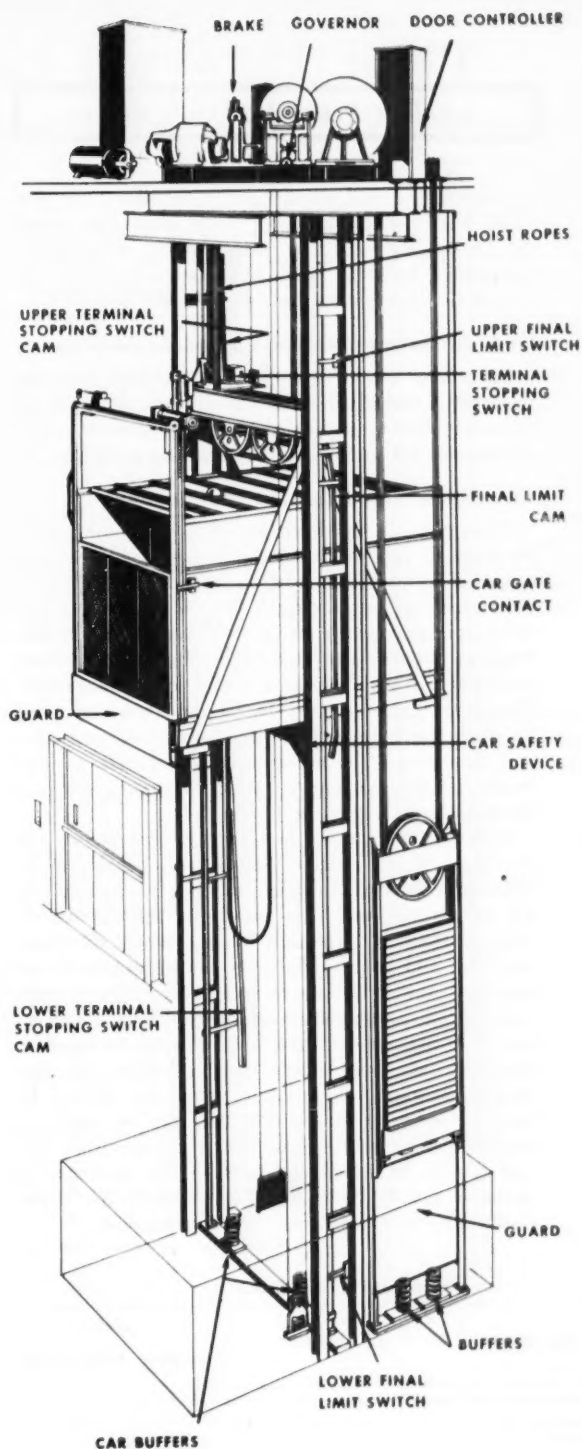
Today's elevator has several, additional special, safety devices. Many of them relate to hoistway and car entrances. Door interlocks prevent the movement of the car while either the hoistway or car door is open. The hoistway doors cannot be opened from outside the car unless a car is at the floor. Limit switches prevent the car from riding up into the hoisting machinery, or down into the pit, if the operator should accidentally move his switch the wrong way or because of equipment malfunction.

Self-Leveling

Many modern elevators are self-leveling and automatically level themselves within $\frac{3}{8}$ inch or less of the floor. This feature prevents accidents caused by tripping over the car entrance and speeds service because it eliminates "jockeying" to bring a car to a safe level with a floor.

Electronic Door Detector

The most recent innovation in elevator door safety is the electronic door detector which instantly stops and reverses a closing door to avoid striking passengers or material. The safety shoe has an electronic "field of influence" extending almost the full height of both the car and hoistway doors and four inches out from the door edges.



Don't Open Doors With Makeshift Tools

The greatest number of elevator accidents happen to operators and servicemen who open hoistway doors with wires, clothes hangers, screw-drivers and other unauthorized tools, from outside the car when the elevator is not at that floor. This practice is illegal

Accident Prevention . . . Con't.

in some cities, and all modern installations are provided with positive hoistway door inter-locks which can be operated only by a special key retained by responsible building employees, and which will not unlock the door unless the car is at the floor.

Lack of Safety Devices Causes Accidents

One cause of the few elevator accidents that are reported is that some older elevators do not have all the safety devices available. Another is that the safety devices are not maintained in operating condition.

Cleanliness Important in Maintenance

Cleanliness is the keystone of good maintenance. Mechanical and electrical failures can be detected more easily on clean machinery and, what is more important, can be prevented. Dirt and dust foul contacts, gum up moving parts, hide cracks and breaks. Vacuum cleaners are often used to keep the elevator machinery clean. Paint is a useful maintenance tool. Aluminum paint is used in the hoistways of some buildings for brightness as well as surface protection and cleanliness. The accumulation of debris, oil and grease in the machinery room, shaft and pit is a fire-hazard that must be eliminated.

Maintenance should be regular, systematic and recorded. Many routines have been developed by different engineers to meet specific conditions. As far as possible, one man should be responsible, receive instruction (especially on the newer electronic controls) and be provided with the correct tools and supplies. Among points to watch especially is rope wear. Rope inspection is required by law and by insurance companies. Safety devices must be checked. Inasmuch as many safety devices seldom function because of rope failure, they should be worked by hand periodically to see that they are in operating condition. The safeties actuated by the governor system should be tested by running the governor at excessive speeds. Some building engineers use a specially adapted electric drill for this purpose.

DUMBWAITER ACCIDENTS

Approximate Cause of Accident	1949-50		
	Minor	Serious	Fatal
Hurt while reaching into dumbwaiter when mechanic moved car by manipulating magnet switches on controller.		1	
Person reaching into dumbwaiter hatch, lost balance and fell down hatch.			1
Person injured hand when partially opened door fell.		1	
Hand caught between sections of bi-parting hoistway gate.	1		
Person riding dumbwaiter caught leg between hatchway and car.	1		
Worker on top of car pinned when dumbwaiter started up.	1		
Hurt while reaching into car when car moved. Defective lock and contact.	1		
Workman injured repairing fouled ropes on machine.	1		
Arm caught between dumbwaiter and hatchway door frame.			
Hatchway door contact blocked closed.	2		
TOTAL	7	2	1



SECURE LOADING is provided when elevators are equipped with self-leveling feature, eliminating jiggling that might spill a skid or pallet load.

Require Care in Riding Car Top

Maintenance is, in itself, a hazardous job because it involves riding on the top of the cab to check machinery and cables. Strict precautions must be enforced during maintenance. In some cases, the inspecting member of the maintenance crew rides on the top of the car while his partner inside the car moves it slowly in response to instructions from the man on top. If this system is used, the type and manner of giving instructions should be agreed on beforehand and the operation carefully co-ordinated. A better system involves the use of a plug-in electrical jack which is operated by the man on top of the car. The regular controls are inoperative and the car can be moved only by the top man. The jack has only two buttons, "up" and "down", and should be of the continuous pressure type. The electrical hook-up with the main elevator controls is such that only the slow speed circuits are actuated by the jack—insuring a slow, safe, speed well-suited to inspection work. Over-head clearance must be watched carefully as the car approaches the upper limit. When working in a multi-car bank, maintenance men must avoid the cars and counterweights in adjoining hoistways and pits.

Electrical machinery and devices should be inspected, as far as possible, with the circuits open.

Everyone concerned, even remotely, with the elevators must be informed when maintenance work is in progress. Avoid, "I-didn't-know-anyone-was-working-in-that-shaft", accidents.

Some cars have a curved top to reduce air resistance but a curved surface is difficult to work on. A lightweight, flat platform should be temporarily installed on the curved car top for safety during maintenance.

Have Spare Parts on Hand

To make the most of good maintenance practice, spare parts should be available.

It is far better to replace a doubtful part immediately than to wait until the part actually fails. In addition, equipment failures sometimes have a way of being cumulative. The failure of a defective part may cause the breakage of a sound piece.

Data and pictures on elevator safety courtesy Otis Elevator Company.

Trouble Shooting Chart For WIRE ROPE

Here are sources of troubles and measures for their correction.

DAMAGE	PROBABLE CAUSES	CORRECTIONS (In Addition to Replacing Rope)
EXTERNAL WEAR	Sheaves wrong size	Replace with correct size new sheaves.
	Sheaves worn	Replace with new sheaves.
	Insufficient Lubrication	Clean and relubricate. Provide regular lubrication.
	Dragging or rubbing on obstructions	Remove obstructions or deflect rope with sheaves or rollers.
	Sheave bearing frozen	Replace bearing or sheave and bearing.
	Sheave weight excessive	Replace with lighter weight sheave.
	Fleet angle excessive	Move sheave farther from drum or replace with a fleeting sheave.
	Sheave guard rubbing	Repair or replace guard.
INTERNAL WEAR	Sheaves mis-aligned	Align sheaves.
	Abrasive penetrating strands	Clean and lubricate regularly.
	Sheave diameter too small	Replace with correct diameter sheaves.
	Reverse bending	Change reeving to eliminate reverse bending.
SNAGGING OR CUTTING	Sheave flange broken	Replace defective sheave.
	Drum groove damaged	Repair or replace drum.
	Overwinding on drum	Use longer drum, less rope, or install drum follower.
STRANDS BROKEN	Excessive wear	See causes of wear, above.
	Overloads, shock loads	Use larger rope, smaller loads, gradual application of load.
	Reverse bending	Change reeving to eliminate reverse bending.
	Fatigue at connections	Cut back ends and replace fittings.
	Rope coming off sheaves	Use sheave guards, correct the alignment of sheaves, reduce fleet angle.
	Sheave or Drum diam. too small	Replace with correct diameters.
DEFORMATION	Rope coming off sheaves	Use sheave guards, correct the alignment of sheaves, reduce fleet angle.
	Kinks	Unwind rope from spool and reeve without twisting or looping.
CORROSION	Insufficient lubrication	Provide regular lubrication.
	Acid or moist conditions	Shield rope and lubricate often.
HEMP CENTER DESTROYED	Acid or caustic fumes or fluids	Shield rope from fumes and fluids. Clean and lubricate often.
	Excessive heat	Shield from heat or replace with metallic center rope.

ARE YOUR BUILDINGS

Saboteurs of Material

SO YOU think you operate a safe plant. All your material handling equipment is of the best, and operators have been thoroughly trained in its correct use. . . . Apparently, you have left no stone unturned in your attempts to help reduce the 1 in 3 accidents which can be charged to poor material handling.

Hold off with that pat on the back just a little longer, however. Safety in material handling involves more than the purchase and correct use of good material handling devices. There are less obvious factors which must be considered thoroughly. For instance, how about the building itself? Is the structure which houses your production facilities inherently safe for handling? If not, what has been done to make it safe?

A logical way to look at the building, is from the bottom up, starting with the floors which control more flow through production than any other physical part of the plant.

Floors

Depending upon the type of operations in your



DAY-DREAMING OPERATORS are warned when they are at edge of aisle, by raised markers which taper up to quarter-inch high centers. This photo shows an important point in safety . . . keep all aisles clear.

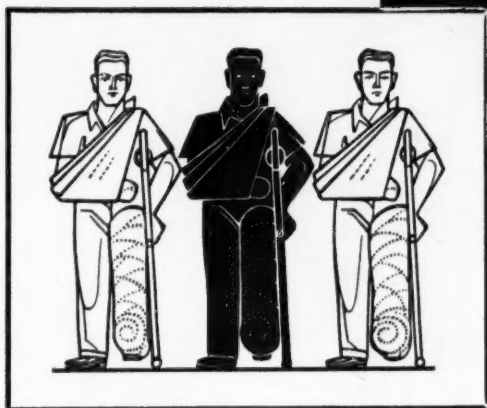
plant, you will find that most of the following floor conditions will have great effect on your material handling:

1. *Slipperiness*—Does the surface of the floor tend to be slippery to vehicles moving over it? If so, is it made of a material which can be given a skid proof finish and which will retain its skid proofness.
2. *Absorptive Qualities*—Will the floor become dangerously slippery when oil or other liquids spill on it? Can it be cleaned? It is important to remember that floors with high absorption are generally harder to clean since they tend to retain much of the spilled liquids. A study of specific requirements in every instance will help to determine correct absorption qualities.
3. *Color*—Will the color of the floor contrast with the color of objects which might be stored on it? Does it contrast with the color of liquids being handled and which might be spilled. This last point is of vital importance to industries which work with explosives.



MECHANICAL FLOOR SWEEPER, used in conjunction with absorbent floor cleaning compound cleans liquids as well as solids from floors. This is a safety aid on floors which will tend to absorb and hold liquids.

Handling?



TUNNELS CAN BE DANGEROUS if proper precautionary measures are not taken. At this company, double striping, accepted as standard on highways is readily understood by all employees. Clear, large signs direct traffic and instead of being a hazardous area, the tunnel becomes a safety aid.

4. *Non-sparking or static disseminating Properties*—Floors which are non-sparking or static disseminating, render additional safety where handling equipment moves in areas where hazardous, inflammable or explosive materials are being handled, manufactured or stored.
5. *Durability*—A floor with poor durability becomes dangerous to material handling as it succumbs to the pounding of heavy traffic.

Cleaning of Floors

Clean floors are a necessity for more than just good appearance. They are a necessity to any thorough safety program as well. Obvious dangers inherent in any type of operation as a result of improper floor cleaning include the hazard of debris left lying on floors to cause falls and the breeding of disease germs in trash not cleaned out regularly.

For maximum efficiency in floor cleaning, you would do well to investigate the possibility of using mechanical sweepers. They can be counted on to do this task faster and more completely than would the old hand and pushbroom method.

For hard-to-clean floors with high absorption rates, absorbent floor cleaning compounds used in conjunction with mechanical sweepers will pull out much of the liquids which might otherwise remain in the floor to plague safe handling.

Floor Repairs

Too often, there is a tendency to permit ruts and cracks in floors to remain unrepaired until an entire aisle or area becomes bad enough to warrant complete re-surfacing. For safety and greatest efficiency, it is much more reasonable to make floor repairs when they are minor.


Today, there are several excellent patching materials available, which can be applied to a floor and run-over almost immediately afterward, with little interruption to normal traffic. This is important, of course, since most damage to floors occurs in areas where the need for a high rate of traffic is greatest.

Patching should not be misunderstood as permanent repairing, however. It should be recognized and considered as only a temporary method of insuring safety and efficiency in handling on floors until such time as permanent resurfacing can be scheduled.

Floor Marking

Lines marked on floors inside and outside the plant can do more than almost any other precautionary measure to organize production activities in a plant so that they are efficient and safe. Lines insure safety by instructing personnel, specifying areas for aisles, storage, raw material areas, parking, etc.

It isn't very difficult to maintain effective floor lines. Machinery and material have been developed to



AN INVITATION TO ACCIDENTS . . . This poorly lighted, cluttered manufacturing area (above) was dangerous, unsanitary and inefficient. With correct lighting and a cleaning up, it was transformed into . . .

A SAFE, MODERN TEXTILE PLANT . . . Aisles are now clear, for efficient movement of materials. Notice how proper lighting has cut treacherous shadows.



make the job semi-automatic in one and two-man operations. Plastic, brass and polished steel disks are available and can be set flush in floors, or so that they are slightly rounded to warn day-dreaming truck operators when they ease over to the edge of a traffic lane. Self-adhering plastic tapes are quickly and easily applied as are special paints which can be applied regardless of oil and grease problems, and which dry so quickly that production need not be interrupted for application.

Color Identification of Danger Spots

A safety color code, published by the American Standards Association should be studied carefully by all material handling men. Copies are available from the association for a cost of \$1.00 each.

Briefly, the code prescribes basic identification colors as follows:

Red—For identification of danger spots and to indicate a control for emergency stoppage of equipment.

Orange—Designates dangerous parts of machines or

energized equipment which may cut, crush, shock or otherwise injure.

Yellow—For designating caution and for marking physical hazards such as: striking against, stumbling, falling, tripping and "caught in between". The code recommends that all material handling equipment (or areas thereon), such as industrial tractors, trucks, trailers, fork-lift trucks, conveyors and elevator gates be marked in solid yellow, yellow and black, or yellow and any contrasting color which aids in creating the best attention.

Green—The basic color for designating "safety."

Blue—For designating CAUTION, limited to warning against the starting of, the use of, or the movement of equipment under repair or being worked upon.

Purple—The basic color for designating radiation hazards.

Black & White—Combinations of black and white or the two colors used individually are for the designation of traffic and housekeeping markings. These colors will help to identify dead

ends or aisles or passageways, location and width of aisleways, stairways and directional signs.

Lighting

The effect which improved lighting has on safety in handling, and in all other operations in a plant, cannot be minimized. Poor lighting can be listed somewhere under "cause" for one out of every four industrial accidents. It may not be the primary cause every time, but you'll find that the lack of light was a factor behind many slips and falls and other injuries which have occurred.

A good lighting plan frees your hand. It permits you to make needed improvements in the arrangement of production machinery, conveyors, cranes, hoists and other handling equipment. It eliminates your dependence upon outdoor light sources and lets you make the most efficient use of your entire floor areas.

There are three basic types of light sources from which to select. . . . **Fluorescent lamps** give more light per dollar of total cost than filament lamps, even though the initial cost and maintenance costs of the fluorescent installations are higher in equivalent systems. **Mercury-vapor lamps** approach fluorescent lamps in efficiency, and at the same time, incorporate as much wattage in a single bulb as a filament lamp. Initial cost is relatively high, and this type lamp works best in high-bay areas. **Filament lamps** have the lowest initial cost, lowest maintenance expense and greatest range of lamp sizes. They are the least efficient, however.

The problems involved in lighting outdoor areas, (outdoor storage areas, railroad sidings, docks, etc.) are, in many ways, different from those in lighting the interior of a plant. In the first place, there are no walls and ceilings from which to reflect light advantageously. All light must be derived directly from the source. It is usually recommended that for best results outdoors, a large number of lower wattage lamps be used. Then, if one or several lamps should fail, the effect on the overall lighting of the area will not be readily noticeable.

General Considerations

In general, here are a few of the points to check on to see if your buildings are safe for handling:

1. **Aisles**—Factory aisles should be of generous width, as straight as possible and completely free of obstructions. Where possible, corners should be cut off on a diagonal. If vehicles must pass the aisles should be at least twice the

width of the widest part of the vehicle or load, plus three feet if the aisle is also to be used by pedestrians.

Aisles should be clearly marked. Don't lay them out in such a manner that persons or vehicles approaching—from doorways or side aisles are exposed to possible collision.

The floor surface should be free of any deformations and it must be kept clean at all times. Aisles should be well lighted.

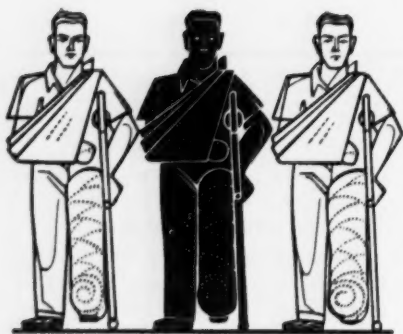
2. **Ramps**—Ramps are useful when slight differences in floor elevations must be negotiated. They should not exceed 10% in grade.

Obstructions—Pipes, conduits, drains, valves, fire apparatus, heaters, etc. are necessary parts of plant structures, yet they are often nuisances or even hazards. In planning the plant, they should be placed so that there will be a minimum of interference with persons or materials.

FLOW's thanks to The Master Builders Co., for information contained in the preceding article.



SHADOWS ARE DANGEROUS . . . and a well planned lighting system for a yard storage area is vital. Banks of lights can be mounted on nearby buildings or on poles. Often, poles are placed in spots within the storage area itself and arranged so as to further reduce shadows. For yards, the use of many lower wattage lamps per pole rather than relatively few higher wattage lamps, reduces effect of burnouts.



Cutting Outdoor Handling

exercise of extra care
by yard workers
is an important must

EXPOSED TO THE ELEMENTS, men and machines need extra care and closer attention if maximum safety is to be maintained in outdoor handling operations.

Fatigue in employees is a major cause of industrial accidents. It is most common in the operation of heavy equipment. And it is especially true in the operation of machines which require alertness, close coordination of mind and body, and keen judgment. A man's judgment is never keen when he is suffering from physical fatigue.

Fatigue in equipment is another major problem. Few men realize how far back an accident starts. Bolts become loose; fatigue starts in structural members, gearing, cables, etc.; poor lubrication slows up an operating cycle at a crucial moment; poor housekeeping may prevail in the yard—all pointing to potential accidents.

To help combat fatigue in an operator of equipment used outdoors, as well as to promote general efficiency, see that he has a comfortable seat, that controls are within easy reach; give him a cab, if possible, with

windshield wipers, heater, fan, and awning; provide him with sun and safety glasses where applicable; be sure he has normally unobstructed vision in all directions.

In minimizing effects of fatigue on equipment, impress upon operators and maintenance men that, outdoors, equipment is exposed to wind, water, ice, snow, and mud; that it is continually subjected to severe shock loads, particularly in unpaved areas; and that it is frequently exposed to severe abrasive dust conditions. These add up to the need for even more maintenance care than has been stressed in other articles of this issue. Follow manufacturers' recommendations explicitly. If the equipment is to be used both inside and outdoors, ask for instructions on any special care that may be desirable.

Extra Emphasis for Vehicles

Operation of industrial vehicles in the yard should be on the same basis as prescribed for in-plant handling. There are, however, a few points where extra emphasis should be placed.



MOVING load must be watched constantly. If operator has to look away, he should stop hoist, swing & lowering motions until he can again concentrate on load.



PROPER HAND SIGNALS are essential in crane operations to prevent damage to men and equipment. Here, signals direct loading of highway truck.

Risks



SAFER operation of yard equipment results when drivers are sheltered from elements.



ALERTNESS is characteristic of good operator of heavy duty handling equipment. He needs clear vision and awareness of all potential danger situations.



LOADING of trucks should be from the rear whenever possible. If a boom must be swung over a cab, operator should be sure driver is not in truck.

Cut Outdoor Risks . . . Con't . . .

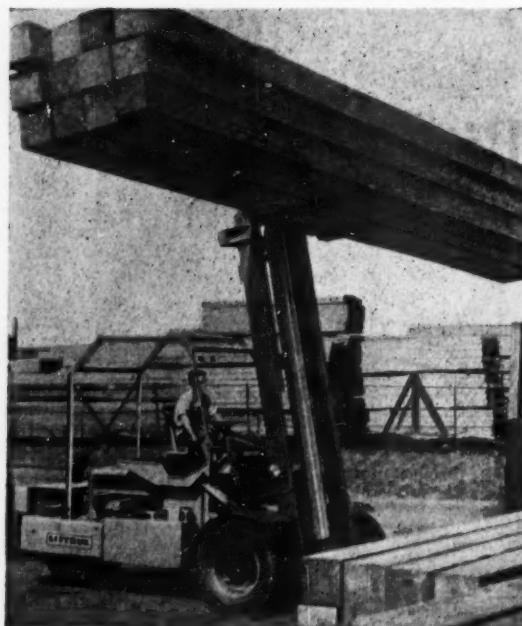
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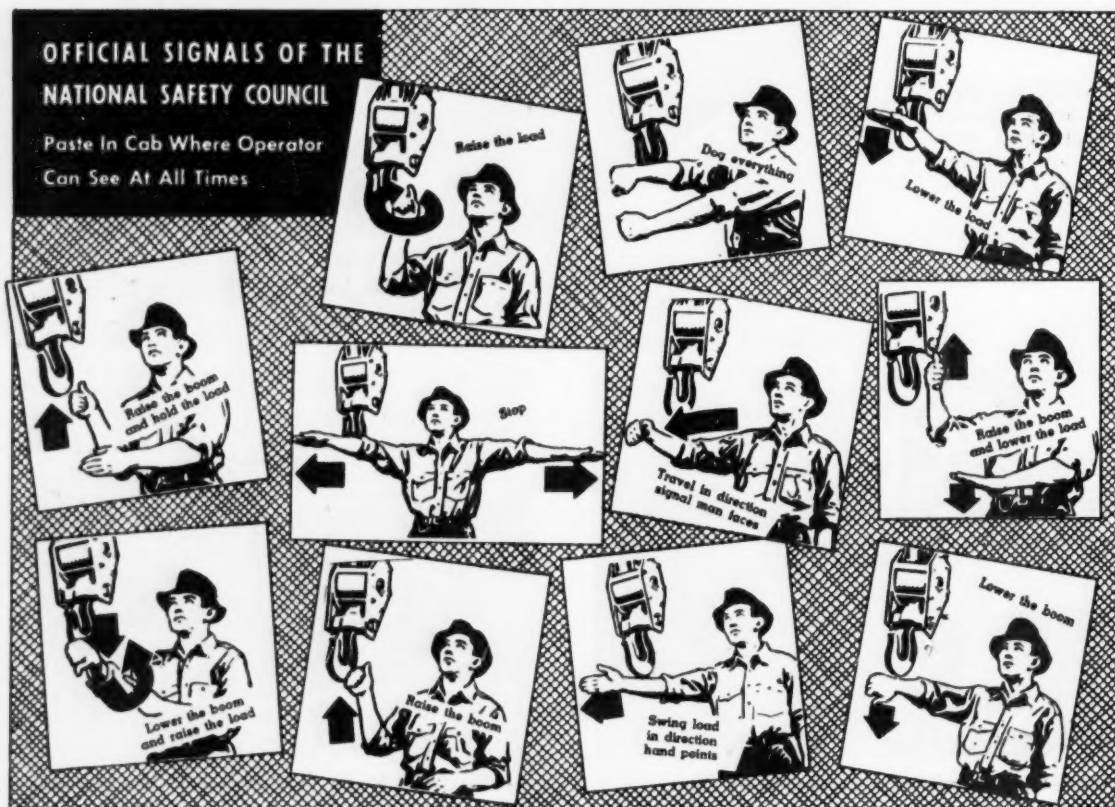
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Concise instructions for safe crane and shovel operations are given on the accompanying data sheet

(Continued on page 89)



PROTECTION of overhead safety guard is provided to operator handling heavy, awkward loads. Guard may be covered with fabric to keep out sun and rain.



20 Rules for Safe Operation of Power Shovels and Cranes



1. KEEP BOOM AT LEAST 6 FEET IN THE CLEAR OF ALL OVERHEAD WIRES.

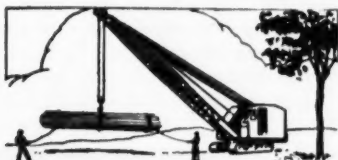


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c. If you have to leave the machine—JUMP, DO NOT STEP OFF.



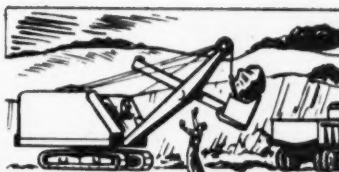
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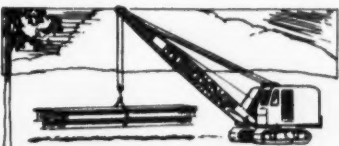
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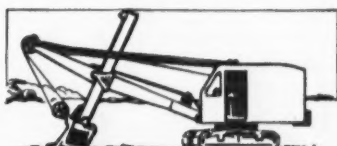
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12. INSPECT CABLES AND CLAMPS ONCE EVERY WEEK.



13. SHUT OFF THE POWER AND LOCK ALL CONTROLS BEFORE LEAVING THE CAB.



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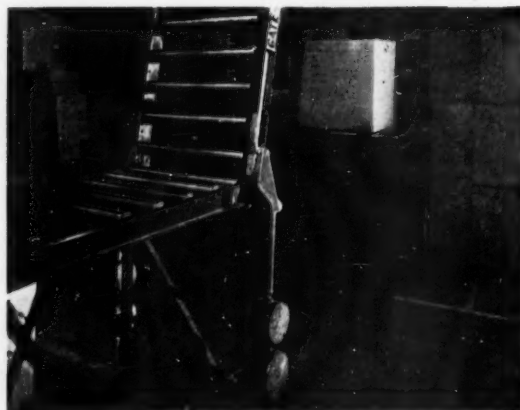


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OUTDOOR RISKS . . .

(Continued from page 80)

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Booms should have means which prevent them from raising past a safe angle. Safety devices will prevent a boom from lowering whenever the boom-hoist or boom-lowering clutch is disengaged. When a pneumatic tire mounted crane is travelling at any amount of speed over rough territory, the boom should not be carried at a high angle of more than 60 degrees. Otherwise there exists the danger that it may whip over backwards. When lifting to capacity, or with low angles over the side, outriggers should be used. Without them, tires may become dangerously compressed and rebound suddenly when the load is released.

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OUTDOOR RISKS

Continued

the hoist line slowly and attach it to a heavy mobile unit, such as a truck with the brakes set. When the attachment is secure, drive the truck slowly forward to bring the boom down.

Another method is to back the crane slowly onto a moderate grade ramp. The change in the center of gravity should bring the boom forward.

Safety aids on equipment itself should include anti-skid floor plates wherever a man is expected to walk, convenient hand grabs for operators and oilers, guards and shields over gears, and sturdy fuel tanks from which vapors cannot escape.

Keep machines clean. Grease and oil on floors and steps can lead to dangerous falls.

See that safe lifting capacities of the equipment are securely and conspicuously posted, that operators and hitchers are fully informed of them.

Some cranes are equipped with safety cut-outs which limit lifting capacity to that specified by the manufacturer. It is also possible to have an audible over-load signal.

Among other points of which operators should be acutely aware is the effect of grade. If a machine is lifting on a down-grade, and the boom is pointing down the grade, the radius will automatically be greater than when the crane is on level ground. Conversely, when a lift is made with the boom pointing up-grade, the crane is operating at a shorter radius and is correspondingly safer. **But what is an apparently safe load in this situation must not be swung the full 360 degrees—into a dangerous position.**

When outriggers are used, the blocks under the jacks should be snugged so that the crane superstructure is made completely solid. If a crane can start a tipping motion before the blocks come into play, it may be too late. Blocks should be at extreme ends of outriggers for maximum stability.

Avoidance of wires is highly important. There is available a

OUTDOOR RISKS

Continued

special antenna which is fastened to the end of a boom. When the boom is moved too near high tension wires in a yard area, the operator in the cab is warned by a buzz.

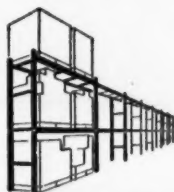
As a general rule, maintenance work should not be done while a motor is running. If a part must be moved during servicing, be sure a fully competent operator is on the equipment. No piece of equipment, on crawlers or wheels, should be left running on an inclined surface in the absence of the operator.

Possibly of greater importance than any other operating phase is the matter of proper signals. All those working with power cranes and shovels should know them by second nature. A signal erroneously or carelessly given can lead to disaster.

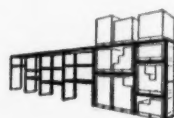
For cooperation and assistance in the preparation of this article, FLOW thanks the following: Allis-Chalmers Mfg. Co.; Bucyrus-Erie Co.; Caterpillar Tractor Co.; Coles Cranes, Inc.; Gerlinger Carrier Co.; Hughes-Keenan Corp.; Hyster Company; Koehring Company; Link-Belt Speeder Corp. (page of rules on safe operation of shovels and cranes); Osgood General; Schield Bantam Co.; Silent Hoist & Crane Co., Inc.; and The Thew Shovel Company.



When you choose your PALLET RACK



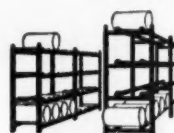
Standard Pallet Racks



Adjustable Pallet Racks



Skid Racks



Drum & Barrel Racks



Tool & Die Racks



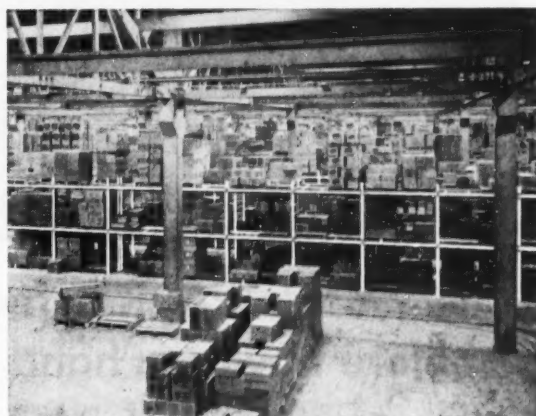
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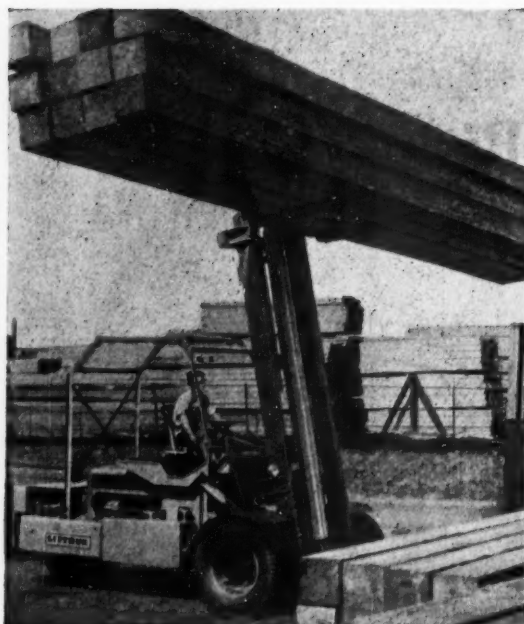
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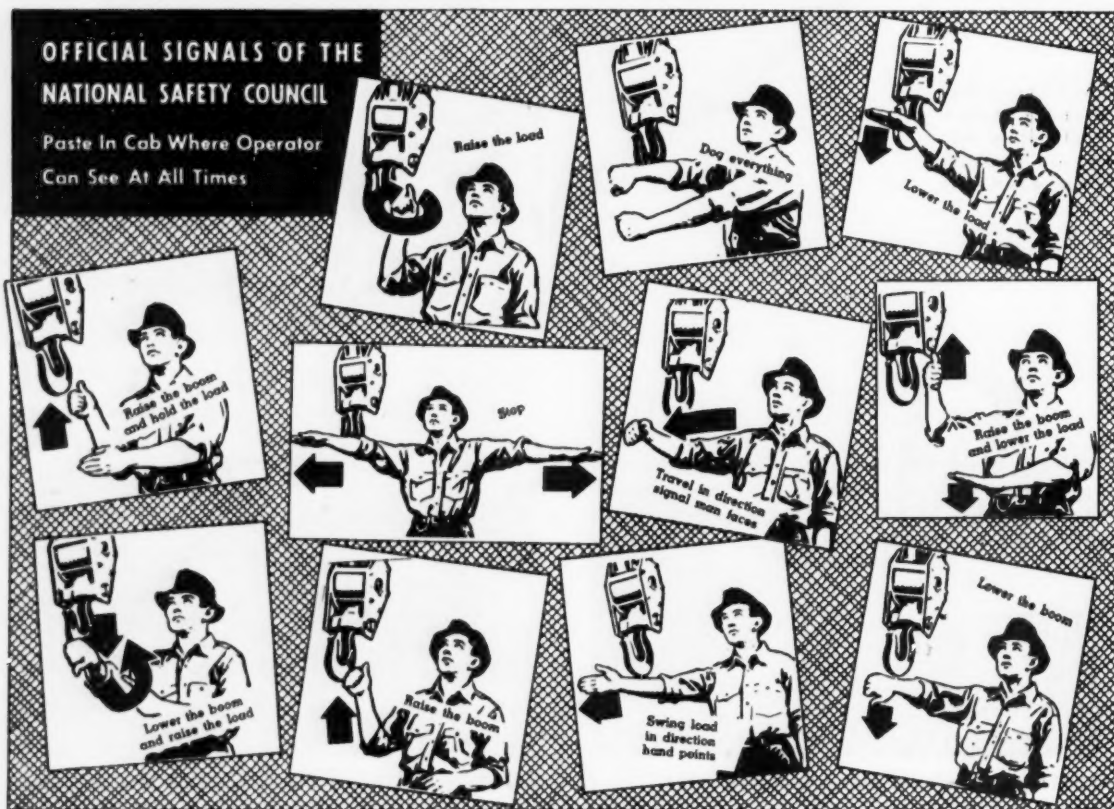
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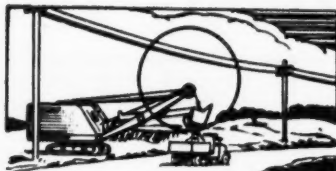
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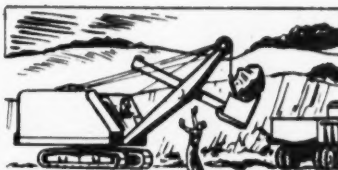
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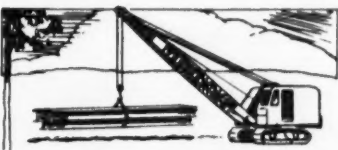
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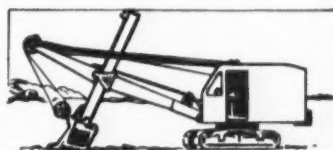
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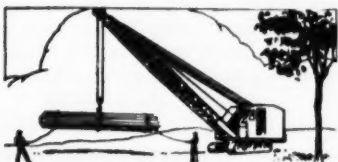
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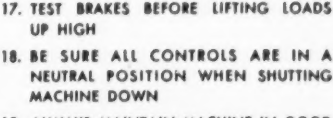
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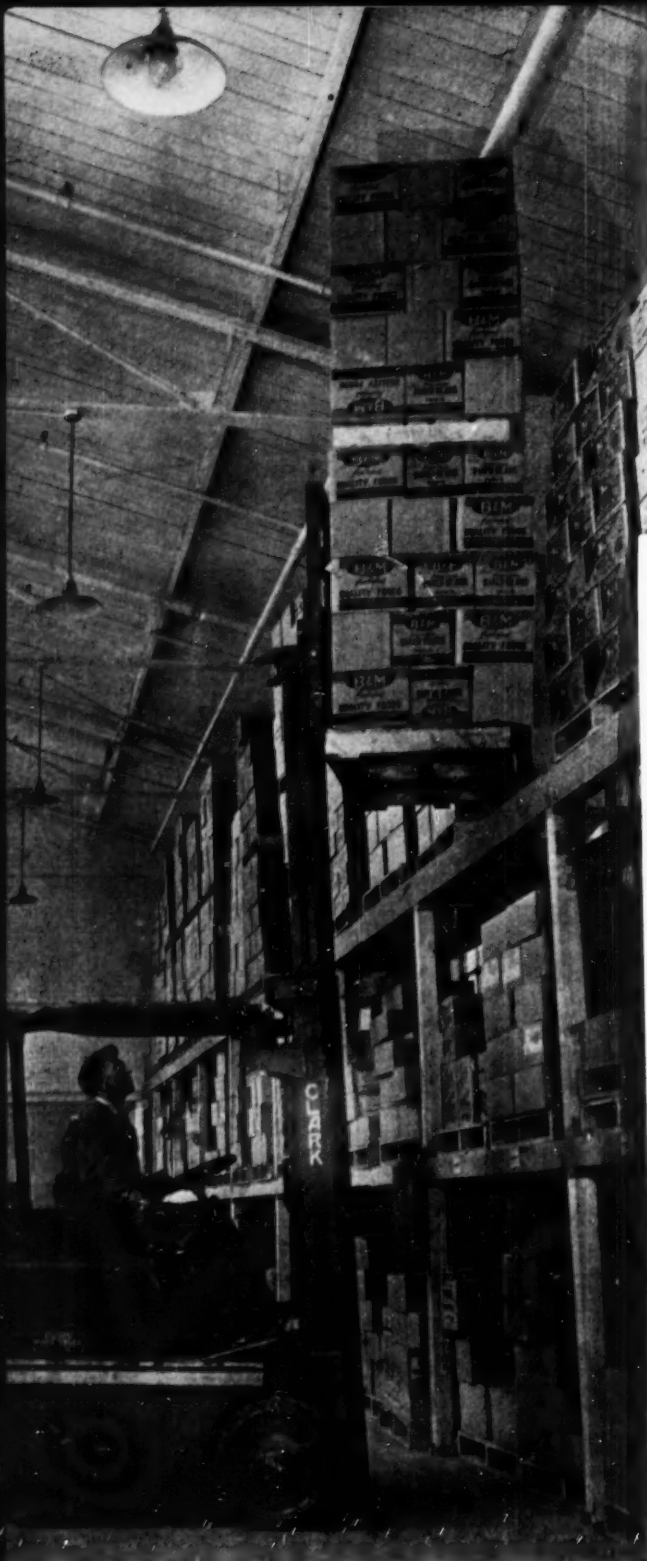
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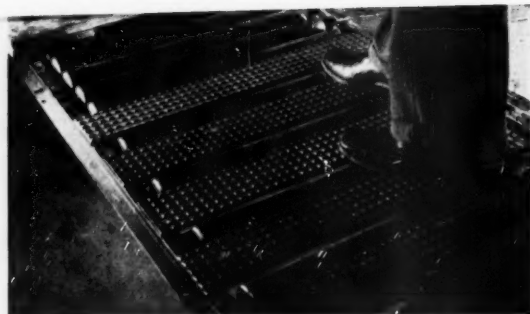
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PAC MISS



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OUTDOOR RISKS . . .

(Continued from page 80)

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AGES SSING

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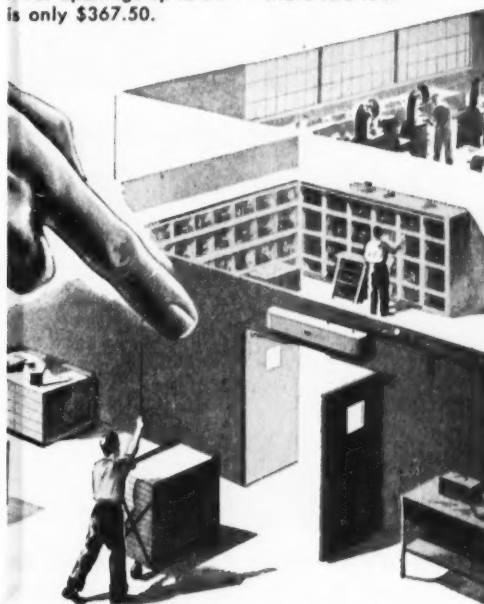
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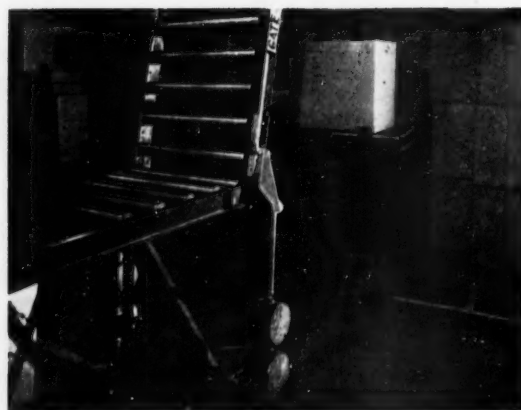
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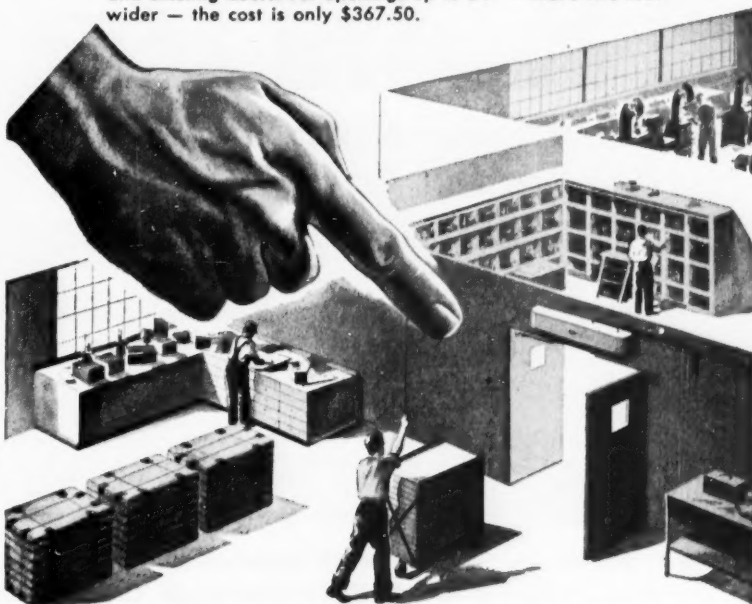
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• Handidrive belt, live roller and gravity roller conveyors consist of drive and take up units, and roller assemblies, intermediate framework, supports and hanger, to make complete conveyors—or to convert present gravity conveyors to power conveyors. Write for Bulletin 63-D, address Dept. FL-123.

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OUTDOOR RISKS

Continued

the hoist line slowly and attach it to a heavy mobile unit, such as a truck with the brakes set. When the attachment is secure, drive the truck slowly forward to bring the boom down.

Another method is to back the crane slowly onto a moderate grade ramp. The change in the center of gravity should bring the boom forward.

Safety aids on equipment itself should include anti-skid floor plates wherever a man is expected to walk, convenient hand grabs for operators and oilers, guards and shields over gears, and sturdy fuel tanks from which vapors cannot escape.

Keep machines clean. Grease and oil on floors and steps can lead to dangerous falls.

See that safe lifting capacities of the equipment are securely and conspicuously posted, that operators and hitchers are fully informed of them.

Some cranes are equipped with safety cut-outs which limit lifting capacity to that specified by the manufacturer. It is also possible to have an audible over-load signal.

Among other points of which operators should be acutely aware is the effect of grade. If a machine is lifting on a down-grade, and the boom is pointing down the grade, the radius will automatically be greater than when the crane is on level ground. Conversely, when a lift is made with the boom pointing up-grade, the crane is operating at a shorter radius and is correspondingly safer. **But what is an apparently safe load in this situation must not be swung the full 360 degrees—into a dangerous position.**

When outriggers are used, the blocks under the jacks should be snugged so that the crane superstructure is made completely solid. If a crane can start a tipping motion before the blocks come into play, it may be too late. Blocks should be at extreme ends of outriggers for maximum stability.

Avoidance of wires is highly important. There is available a

OUTDOOR RISKS

Continued

special antenna which is fastened to the end of a boom. When the boom is moved too near high tension wires in a yard area, the operator in the cab is warned by a buzz.

As a general rule, maintenance work should not be done while a motor is running. If a part must be moved during servicing, be sure a fully competent operator is on the equipment. No piece of equipment, on crawlers or wheels, should be left running on an inclined surface in the absence of the operator.

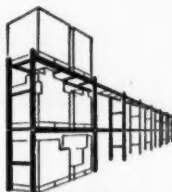
Possibly of greater importance than any other operating phase is the matter of proper signals. All those working with power cranes and shovels should know them by second nature. A signal erroneously or carelessly given can lead to disaster.

For cooperation and assistance in the preparation of this article, FLOW thanks the following: Allis-Chalmers Mfg. Co.; Bucyrus-Erie Co.; Caterpillar Tractor Co.; Coles Cranes, Inc.; Gerlinger Carrier Co.; Hughes-Keenan Corp.; Hyster Company; Koehring Company; Link-Belt Speeder Corp. (page of rules on safe operation of shovels and cranes); Osgood General; Schield Bantam Co.; Silent Hoist & Crane Co., Inc.; and The Thew Shovel Company.



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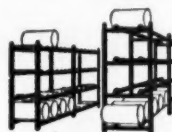
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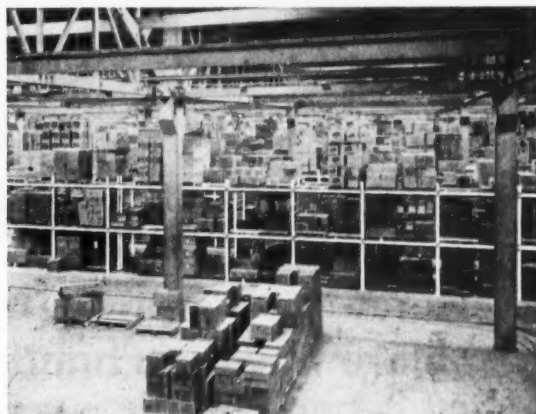


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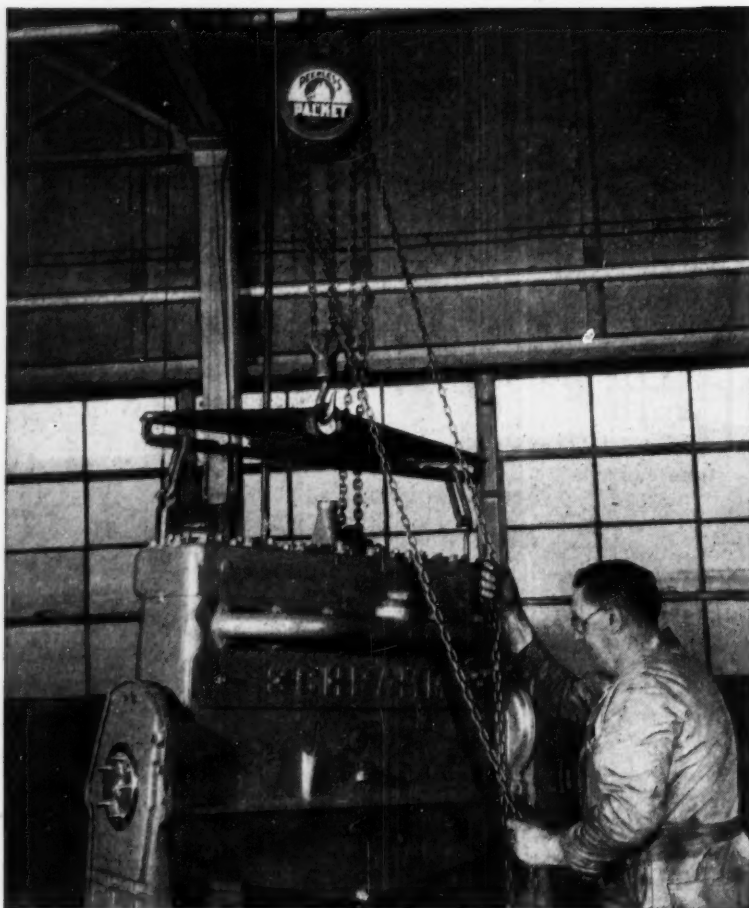
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Highly efficient operation. Rotating parts are mounted on pre-lubricated, shielded ball bearings which have long life, require no maintenance. These bearings, plus simplified gearing and improved friction mechanism, assure extremely smooth operation.

You'll find that these low cost, lightweight, spur geared hoists are easily carried from place to place; can lift capacity loads smoothly and safely. All Peerless Packet Hoists are fully tested, under actual operating conditions, after final assembly. Look in your classified telephone directory under "Hoists" for the name of your nearest Harrington distributor, or write for Bulletin P-5.

HARRINGTON PEERLESS HOISTS

THE HARRINGTON COMPANY, 1648 W. Callowhill St., Phila. 30, Pa. • Since 1876

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NEW EQUIPMENT . . .

(Continued from page 38)

Light Belt Conveyor

A time-saving feature of the Elton "B" series 14-inch belt conveyor is its power lift which makes it possible to raise or lower the machine without stopping it and reversing the

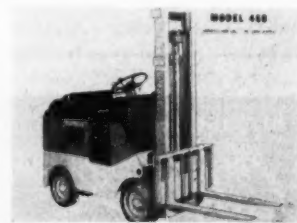


belt. This line of conveyors, manufactured by the Chantland Mfg. Co., is available in sizes from 10 to 35 feet and is furnished with a suitable motor for each size.

Circle 159 on Reader Service Card

Cushion Tires Optional

A choice of solid cushion tires is now offered by To-motor Corporation as original equipment for their lift

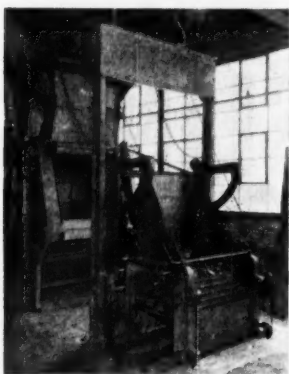


trucks and tractors. Available at extra cost, cushion tires can be furnished in any of four nationally known makes. Said to offer generally longer life than solid tires, the pneumatic type also provides greater riding comfort for the operator and smoother truck or tractor operation.

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Side Entry Charger

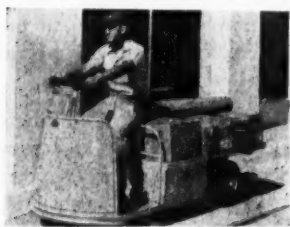
Designed to empty skid boxes, wheeled trucks and other containers into machines or hoppers, the side entry charger



ger shown has a 4000 lb. load capacity, a complete operating cycle of about 30 seconds, and is powered with a 5 h.p. gear motor. It is manufactured by Materials Transportation Co. The side entry charger reaches over when charging—maintaining working area, room for emptying machine, or aisle space next to charged machine. Circle 161 on Reader Service Card

Electric Pickup Truck

Expansion of its line has been announced by Autoette, Inc., to include two new electrically-powered pickup trucks



designed for light hauling. They are being manufactured in quarter-ton and half-ton models and are said to be ideally suited for use in and between industrial plant buildings, warehouses and loading docks. Their batteries can be charged overnight with an operating cost approximately 1/5-cent per ton mile for as much as a 12 hour hauling period.

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NEW... half the weight of steel!

Buschman

PORTABLE ALUMINUM CONVEYORS

WHEEL OR ROLLER TYPE

Lightweight, new Buschman Portable Aluminum Wheel and Roller Conveyor saves time and energy! Rust-resisting, too, so you can use it indoors *and* out! And it's completely interchangeable with steel conveyor sections.

The Buschman Aluminum Conveyor is so easy to set up . . . so quickly changed . . . it gets maximum use. Typical 10-foot section weighs only 39 lbs., compared to 81-lb. steel section. Interchangeable quick-coupling ends drop into place instantly.

Designed for rugged operating conditions, this conveyor is constructed of special alloys with extra bracing, heavy channels and bars. It's all-aluminum except for the heavy duty, grease packed and dust protected, hardened steel bearings. Complete range of reversible curves in 30, 45, 60 and 90-degree sizes; straight sections from 5 to 10 feet long and 12, 15 and 18 inches wide.

Select a few sections of Buschman Portable Aluminum Wheel or Roller Conveyor. You'll quickly see how it stands up under outdoor or indoor service . . . reduces handling costs.

Write Today for Bulletins 15 and 18.

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INDUSTRIAL FLOOR TRUCKS

for every materials handling purpose

"50 Series"



Features removable end racks for K.D. shipment at less freight rate. End racks easily installed in all-steel, "All-Welded" pipe sockets.

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Step up your plant operation! Towsley Task Tailored Trucks accelerate handling of products of unique construction with trucks specifically designed for their mobility.

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All-steel frame "All-Welded" construction for maximum strength and rigidity. Platform of 1" hardwood or of steel. Balance type wheel mounting.



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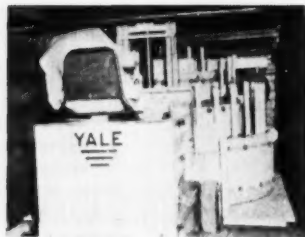
Circle No. 120 on Reader Service Card
94

Fork Truck Takes the Cake

A FEATURE of the President's recent big birthday party at Hershey, Pa., was a 7 foot, 500 lb. birthday cake which suddenly appeared on the stage as Mr. Eisenhower mounted the steps. And a fork truck made the dramatic presentation possible.



The cake had to appear through a trap door—and disappear when the cutting ceremony was over. To handle the job Yale & Towne engineers reduced the overall height of a standard Yale electric truck so that it could fit under the stage; channel height was reduced to a minimum. To hold the cake, an 8 foot square pallet was constructed, and 66 inch forks were fitted to the truck.

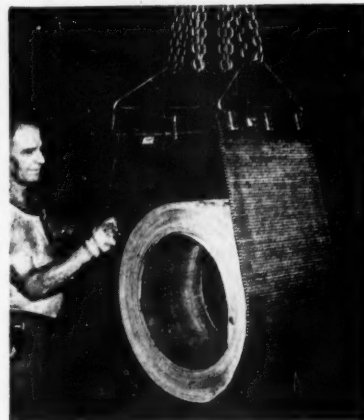


On the night of the performance, Joe Schwartz, expert Yale operator, working in cramped quarters in semi-darkness, lifted the 8 foot pallet squarely into the opening in the stage six feet from the floor. The opening allowed less than three-quarters inch clearance.

GRIPPER

WOVEN WIRE

SLINGS!



TOUGH! You get the benefit of every ounce of sling strength in a basket hitch. Heat treated handles give extra strength. Transverse loop construction won't let sling body snap suddenly!

SAFE! Broad, flat sling body grips tightly around load in a choke hitch. Grips entire load securely, keeps inside members of tubing, rod or bar stock from slipping. Also, no broken wires stick out to cut operator's hands.

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FLOW • DECEMBER, 1953

HIGHLIGHTS . . .

(Continued from page 42)

dous production quantities are not necessary to make automatic handling profitable. Although devices for mechanized handling are often highly technical and complex, they can be built in small units not requiring great capital expenditures.

Benefits for Workmen

What will happen to working people in the age of full mechanization? Mr. Sollenberger had some solid answers to that question. For one thing, they won't be called upon to use their muscles as much as their brains. Science and invention, he said, are "upgrading" industrial jobs by increasing the demand for skill and special training, while reducing demand for brawn. Muscle-power for manual lifting and carrying jobs costs \$10 per horsepower-hour, whereas electric motors running conveyors can do the same amount of work for 4 cents or less. That jobs will be fewer as production efficiency increases has been thoroughly refuted by history, but Sollenberger calls upon modern experience to show how increased mechanism brings increased employment. His example is the automotive industry, probably the most highly mechanized of any, which has doubled its employment in the past fourteen years.

The amount of work to be done, he concluded, is unlimited. And mechanization enables men to apply themselves to more remunerative and more satisfying jobs in producing the goods and services which raise the standard of living.

What's the Reader Service Card?

It is a free-mailing card bound into this issue, and makes it easy for you to get complete information on any item. Use it. It will be worth your while.



FARQUHAR CONVEYORS

**Move Fragile Merchandise
Faster, More Safely!**

Moving heavy, but delicate, television sets was a problem of Motorola-New York, Inc., Newark, N. J.—until Farquhar Conveyors stepped in. The combination of power-driven and gravity conveyors shown above load and unload trucks efficiently, yet gently enough to protect the fragile sets. If the merchandise you handle is fragile . . . or heavy . . . or both, Farquhar engineers can design the right conveyor system for your particular problem.

Whether you move coal, gravel, sand, aggregates, cartons, boxes, bundles, bales, or any kind of bulk or packaged materials—horizontally or from floor to floor—Farquhar can cut *your* handling costs to rock bottom! One or more of the complete line of Farquhar portable, semi-permanent and permanent power-belt or gravity conveyors will solve your handling problem. Our engineers will be glad to consult with you . . . at no obligation!

OLIVER

FREE! "Owners Report"—booklet of case histories showing typical money-saving conveyor installations.

Farquhar
CONVEYORS

MAIL COUPON FOR YOUR COPY

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A. B. Farquhar Division
Conveyor Dept. D-06, York, Pa.

Gentlemen:
Please send me my free copy of "Owners Report."

Name

Firm

Address

City Zone State

**POWER-BELT
AND
GRAVITY
CONVEYORS**

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DO YOU NEED BOTH ROUND and FLAT Steel Strapping?



**Buy both from U·S·S GERRARD
... and save!**

● If you use both Round and Flat Steel Strapping in your plant, you will find that *single source* purchasing from U·S·S Gerrard can save you time, work and money.

You can save time and simplify your paper work by ordering both types of steel strapping, in whatever sizes you require, on a single purchase order.

You can save on freight charges by combining shipments of your Round and Flat Steel Strapping in a single carrier.

Contact a U·S·S Gerrard engineer for information about advantages of Gerrard Round and Flat Steel Strapping in specific applications. His advice is available free of charge. Send for a free copy of *Blue Book of Packaging* and literature about Gerrard's new Flat Steel Strapping.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
2937 West 47th St., Chicago 32, Ill.

GERRARD'S

Packaging Service Includes:

ROUND STEEL STRAPPING From 8 gauge for carload reinforcement and palletizing to 18½ gauge for small bundles, cartons and parcel post packages. May be applied with either hand-operated or semi-automatic Gerrard machines.

FLAT STEEL STRAPPING In heavy duty sizes for palletizing and carload reinforcement.

BAG TIES 12 to 21 gauge wire for tying bags of every material and for bundling posts, rods, pipe and numerous other applications.

U·S·S GERRARD

Round Steel **STRAPPING** Flat Steel

UNITED STATES STEEL



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FLOW • DECEMBER, 1953

PACKAGING and SHIPPING SECTION

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DEVOTED TO THE MECHANICS OF PACKAGING AND
PREPARATION FOR SHIPPING MATERIAL HANDLING FUNCTIONS

An Easy Index to This Month's Advertisers

Are you looking for a particular type of packaging and shipping equipment? Listed below are advertisers according to the type of product they are advertising in this issue. We have attempted to make your job a little easier by listing them as often as possible. To use this index, find the type

of product in which you are interested . . . turn to the advertisers listed under that product . . . circle the correct numbers on the reader service card, mail it in, and you'll get complete information in a jiffy.

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WABASH cuts damage costs
for shippers with
Evans D-F Loader equipped cars

The progressive Wabash Railroad, alert to modern improvements . . . aggressive in testing and adopting cost-cutting methods and equipment, maintains a continuous program of service improvement for shippers.

This far-sighted policy was responsible for the installation of the Evans D-F Loader in Wabash box cars. The D-F Loader is an Evans development that locks in the lading with cross members called "Wonder Bars". These bars make wooden dunnage unnecessary and eliminate damage in transit. The experience of the Wabash has proven that the Evans D-F Loader pays for itself over and over again. They get increased business from shippers. They get increased revenues from heavier loading per car. They realize substantial savings from reduced damage claims . . . slashed to less than 1/4 the national average.

The Evans D-F Loader also has been proven by years of operation and millions of damage-free ton miles on 32 other Class I railroads. Write for illustrated brochure to Evans Products Company, Railroad & Loading Equipment Division, Dept. AF-12, Plymouth, Mich.

EVANS ... **DF LOADER** ...
TO ELIMINATE DAMAGE & DUNNAGE

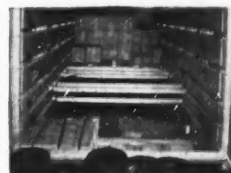
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**WHATEVER THE LOAD . . .
EVANS D-F WONDER BARS
HANDLE WITH CARE!**



**THEY SECURE
THE LOAD**
Wonder Bars,
placed against
the lading, lock
into side rails,
hold the load se-
curely, so it can't
shake, shift or
sway.

**THEY SUPPORT THE
LOAD** Deckboards,
placed on Wonder Bars,
permit multiple loads,
no matter how fragile
the lading. Floor to roof
capacity!



THEY SEPARATE THE LOAD Wonder Bars
and deckboard bulk heads divide lading into
from 2 to 9 compartments — each an easily
handled, securely anchored unit.

**EVANS ALSO MANUFACTURES THE
FAMOUS AUTO LOADER**

STEEL STRAPPING holds top braces in place on ranges which have fold-down back splashers. Other models with rigid back splashers require no extra bracing. Note descending conveyor in background. It carries ranges to packaging area from final assembly located in another building about 1400 ft. away.

CORRUGATED TUBES are placed over range as it moves along conveyor (below). Range was mounted on skid in assembly department.



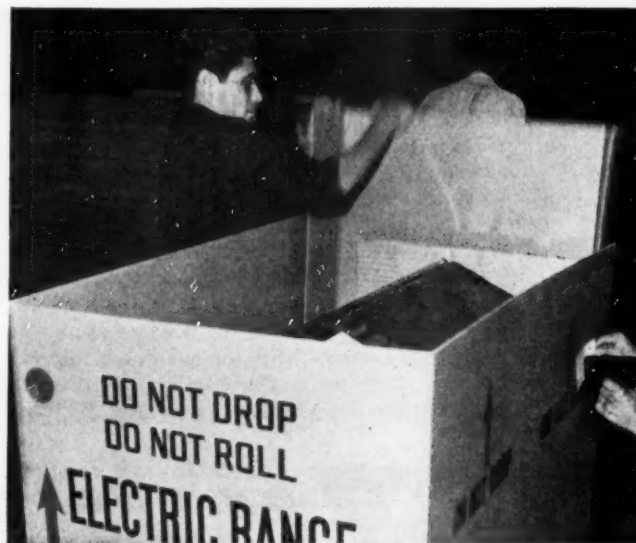
END SUPPORTS fit tightly between sides of container and ends of range. (right) Operator whose hands are seen at right has removed identification tag from range and is stapling it to outside of shipping container. In three sections, the tag serves as: 1. shipping tag, 2. customer identification tag, and 3. stock tag. This eliminates possibility of error.

TOP PIECE of shipping is installed. (far right) Note that the top has extra flanges which protrude into the insides of the carton when in place. The inner flanges serve to provide strength at the top, for handling with clamps suspended from overhead crane which stacks ranges in Hotpoint's warehouse.

Correct Closure

ABOUT two years ago, packaging engineers at the Chicago range plant of Hotpoint Co. developed a new corrugated shipping container. A series of tests proved that the container could well be the answer to all the company's shipping problems. It was relatively low in cost, and provided more than adequate protection for ranges in transit.

It wasn't until recently, however, that the new container could be put to use. During the two years which have elapsed since its development, a considerable amount of time and study have been expended in search of a closure method which could fit into the company's high speed operations.



Sometimes, designing a new container which meets all the requirements for safe shipping and economy leads to new problems for the material handling and packaging engineer. At Hotpoint Co., for instance, a new container meant revamping the company's closure methods. Now, the changes are being completely justified by resulting in lower costs, faster and better packaging, safer shipments.

Method... Important to the Packaging Operation

The Container

The new shipping container consists of an outer tube, top cap, bottom cap, two end supports (interior bracing) and a wooden base. Top and bottom caps are glued tight by means of flaps which fold up around the sides of the box.

The outer tube is constructed of 350 lb. test, double wall A and B flute, kraft corrugated board, and has a stapled manufacturer's joint. The top cap consists of two pieces of 300 lb. test A flute kraft. The two pieces are glued or stapled together, resulting in a top cap with a double set of flaps all around. When this top piece is placed on a container, flaps of the bottom board fit inside the container and flaps of the upper

board fit around the outside. The outer flaps are glued . . . the inner ones merely provide support for the container during gluing operations and during handling when the package is suspended from an overhead crane.

The bottom cap of the new container is a simple piece of 300 lb. A-flute corrugated board with flaps which fold up around the outside of the container. Since adequate support is given at the bottom by the wooden base on which the range is mounted, there are no inner flaps on the bottom cap.

Inner bracing used with the container consists of two end supports made of 200 lb. A-flute kraft. Edges of the supports are folded-over and under. They are used to hold the range down in the container and to add to the stacking strength.

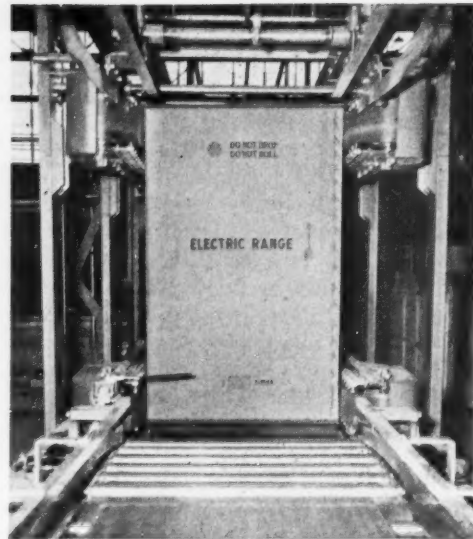
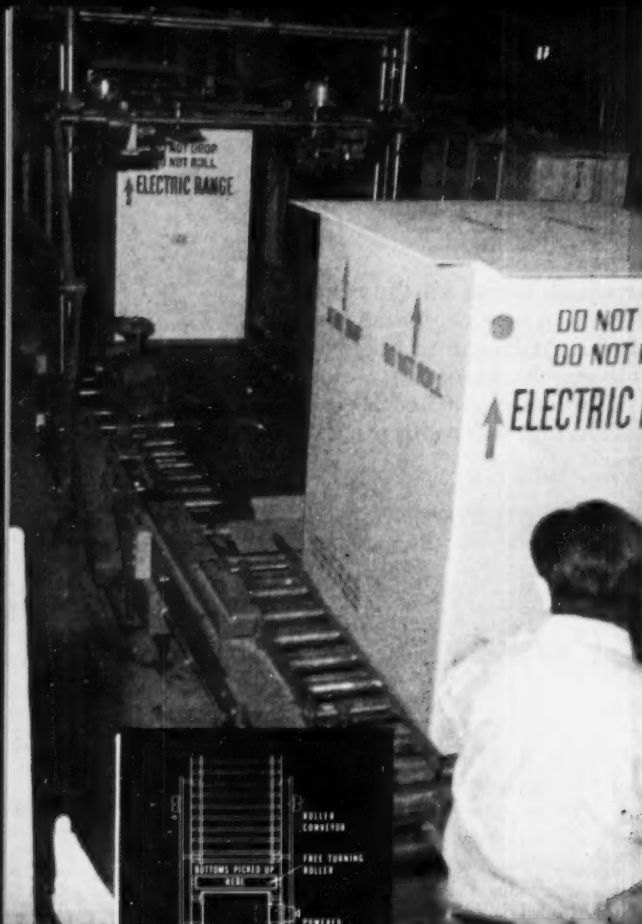
Wooden bases to which the ranges are bolted are made by Hotpoint's packaging department with the aid of an automatic machine. Ranges are placed on the bases at the beginning of assembly.

To test the new package under actual in-transit conditions, ranges ready for shipment were sent to scattered places throughout the country and returned to Hotpoint in Chicago. Laboratory tests in conformance with requirements of the National Safe Transit Committee were also conducted. The package was found to pass all tests satisfactorily.



TO SEE THE GLUER-AND-SEALERS IN ACTION

. . . turn the page



BOTTOM OF CONTAINER is pulled up from beneath as the range moves along on power conveyor (left). Leading edge of the bottom piece rests on a free turning roller. The moving package meets bottom piece so that it is pulled up into place under the package, ready for gluing. In the gluing machine, (top), glue is applied to flanges on two sides and they are then folded against container. Compression is applied for one minute to insure good, lasting seal.

Correct Closure Method

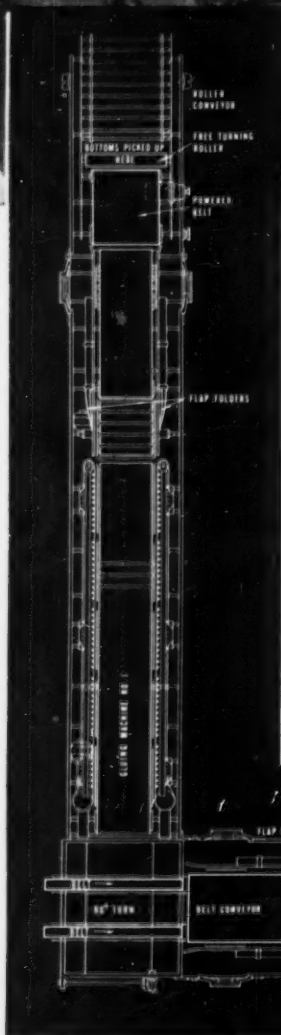
Continued

The Packaging Method

The packaging method which Hotpoint finally developed, and the closing equipment which was finally selected are proving more than adequate in helping the shipping container live up to the claims made for it originally.

Actually, the packaging of Hotpoint ranges begins on the final assembly line located in a building some 1400 feet away from the packaging department. There, the ranges are built up on wooden bases (skids) which become an important part of the final package.

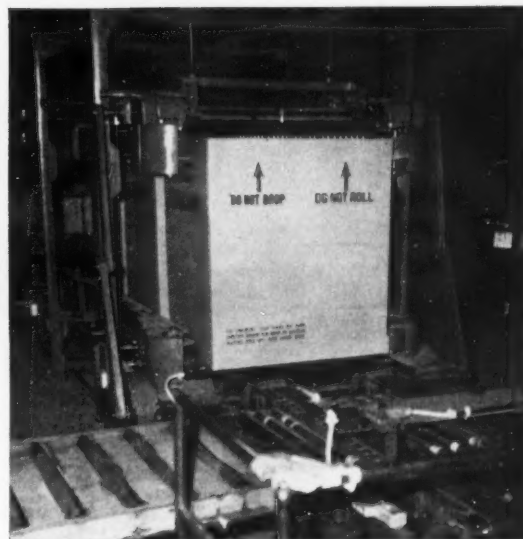
In all, Hotpoint produces eight different models of ranges at this plant. All have the same width and depth with only the heights varying. Completed units are not removed from the conveyor on which they traveled during assembly. They continue on a belt conveyor which carries them up to the ceiling, through the wall, across a street to the building which houses



GLUER - AND - SEALER machines are laid out in "L". to permit gluing of flaps on all four sides of corrugated containers.



90° TURN in the direction of travel of the packaged range is necessary for gluing of two remaining flanges. When container leaves first gluing machine, it moves straight ahead until it hits limit switch. Then, rollers drop down below belts and range then rides to the left into second gluing machine with unglued flaps automatically positioned for the next gluing operation.



COMPLETELY SEALED containers are discharged from second gluing machine and must be turned another 90° (this time to the left) for delivery to storage. This is accomplished in manner similar to the change in direction between machines. Here, however, only one side of the roller conveyor section raises up, rolling packages off and onto a gravity roller conveyor.

the packaging department, through the wall of that building, down to floor level and onto a roller conveyor for packaging. The entire trip requires 12½ minutes.

Larger size models have back splashes to permit them, with their greater height, to fit into the standard container. On these ranges, extra corrugated braces are used for added protection to the back-splasher. The braces fit over the ends of the folded down section and are secured with steel strapping.

As a skidded range moves along the roller conveyor, a corrugated tube is dropped around it. The tube opens up to form the four sides of the shipping container.

At the next station in the packaging procedure, end supports which are the only interior bracing used (other than the special braces around the fold-down back-splasher-models) are inserted. Edges of the end supports are constructed so as to make them fit tightly in the space between the top of the base and the top cap and between the container and product.

As mentioned previously, the top cap is constructed of two pieces of double-wall corrugated board, glued together. The four edges of each of the two pieces which make up the top cap are die-cut into flaps. Therefore, when a top cap is held in position over an open container, the lower set of flaps fits inside, and the top set fits around the outside.

The purpose of the inner flaps is two-fold: In the gluing machines through which the containers will

be passing next, pressure is placed against the sides to permit glue on the flaps to set. The inner flaps provide a solid backing to help insure a good seal; In the warehouse, packaged ranges are stacked up to seven-high through use of special clamps suspended from an overhead crane. The clamps grasp the package near the top where the inner flaps provide additional strength.

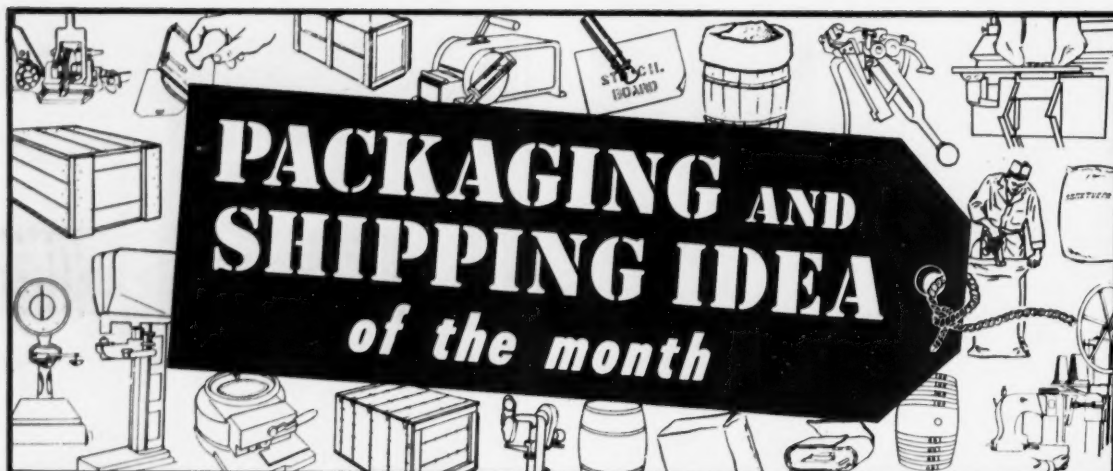
To complete the container, only the bottom cap need be put on. It is done in an amazingly simple, but ingenious way. At the point where the roller conveyor on which the packages have been riding ends, and where a belt conveyor feeding into one of two gluing machines begins, is a slot. A bottom cap inserted into this slot protrudes several inches above the surface of the two conveyors leaning at an angle away from the oncoming packaged range. The top of the cap rests on a free turning metal roller.

The slot has been designed so that the protruding cap and the moving container meet in a way which positions the bottom cap accurately beneath the box.

Two gluing machines are the key to the entire packaging operation at Hotpoint. In them, the flaps on the top and bottom caps are folded against the sides of the containers and glued.

It has been estimated by Hotpoint Co., that the new container plus the packaging method and gluing machines have made possible over 50% savings in the cost of packaging.

FLOW'S thanks to Standard-Knapp Div., Emhart Mfg. Co. for sketch on page 102.



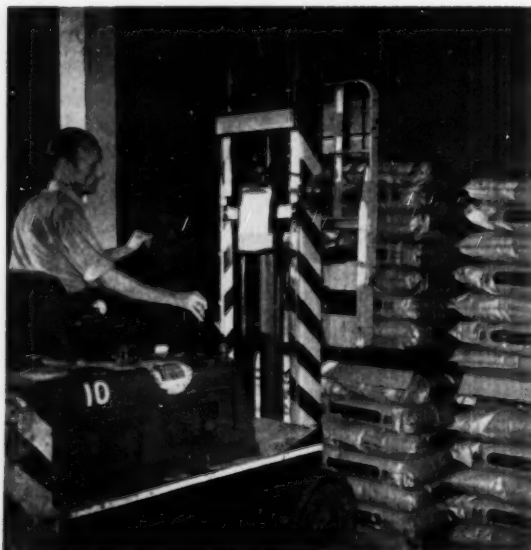
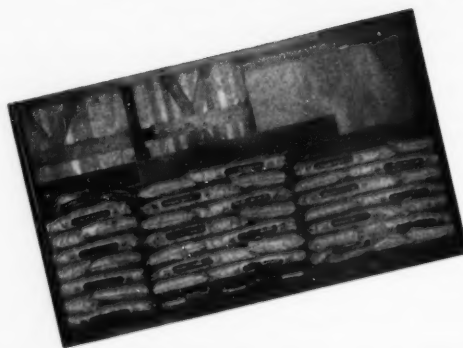
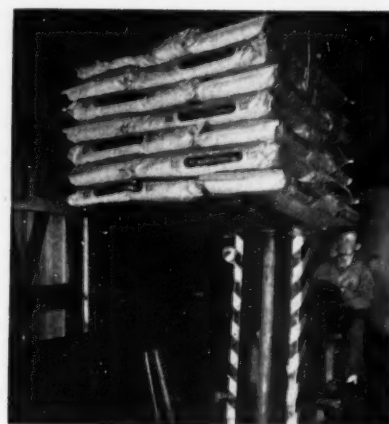
Solution to

Bag Shipping Problem

Both loading and unloading time have been cut greatly by a method developed by Monsanto Chemical Co. for the shipment of bagged phthalic anhydride. Basis of the method which the company offers to customers at no increase in price, is a 25-bag unit built up on an expendable fiberboard sheet. The layers in each unit, interlocked "pinwheel" fashion, are glued bag-to-bag. The result is an extremely stable unit which can be handled easily with a fork truck equipped with polished chisel forks.

Trial shipments have demonstrated that a car loaded in this way can be unloaded in about four man-hours as compared with 15 man-hours when hand unloading is employed.

A 500-lb. bag carload is made up of eight units in the "A" end of the car and ten units in the "B" end. Up to 50 interlocked but unglued bags at the unloading door are removed manually to provide maneuvering room for a fork lift truck.



EXPENDABLE FIBERBOARD SHEET (top) is the basis of the new method of shipping bagged material which was developed by Monsanto.

UP TO 50 interlocked but unglued bags at the unloading door can be removed manually to provide maneuvering room for fork truck at destination. (Center Photograph).

RESULT OF GLUING is an extremely stable unit which can be handled easily with fork truck equipped with polished chisel forks. (left). In addition, efficient storage is easy to achieve.

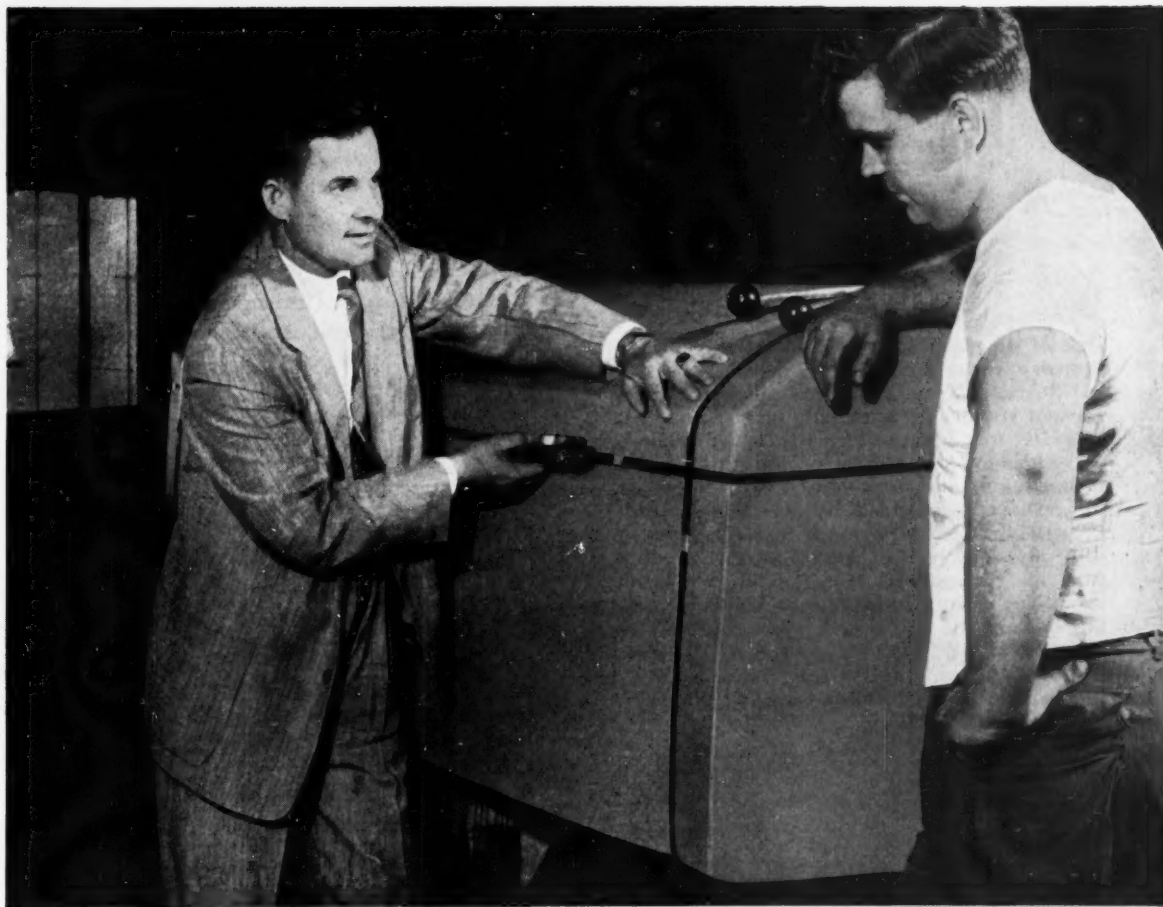


Photo courtesy Clark Grave Vault Co.

Use this complete strapping service!

TRAINED Brainard salesmen can help you develop more efficient systems for packaging, palletizing, carloading, bundling, export crating, and warehousing. For example, here's salesman Jack Worrel of Columbus, giving an *on-the-job demonstration* to a customer shipping heavy steel vaults. Properly applied steel strapping holds the corrugated covering securely in place, protecting the product against damage in transit or in storage.

It's a wise idea to add a Brainard

salesman to *your* materials handling team. He's factory trained in handling and shipping methods. He's equipped to study your operations, make specific recommendations, and demonstrate proper strapping methods to your personnel.

Send coupon now for an analysis of your handling and shipping operations... it can lead to improved efficiency and substantial savings.

Brainard offices located throughout the United States. In Canada: Brainard Steel Canadian Division, Toronto.



PORTABLE STRAPPING KIT... new Brainard Utilikit is a completely self-contained strapping outfit. Lightweight, ideal for carrying to a variety of strapping jobs.



STEEL STRAPPING

Brainard Steel Division, Dept. K-12
Griswold Street, Warren, Ohio

- ☐ Send catalog on Brainard Strapping System
- ☐ Send booklet on new Utilikit
- ☐ Please arrange strapping system analysis of our operations.

Name _____
Position _____
Company _____
Address _____
City _____ State _____

Circle No. 22 on Reader Service Card for more information

FLOW REPORTS ON THE

Eighth Industrial Packaging &

One of the significant events of the year in industry occurred from October 19 to 22 in Boston. More than 100 exhibitors showed visitors an unusually large number of really new ideas and products for greater efficiency and safety in handling and in packaging for shipment. A short course program co-sponsored by the Society of Industrial Packaging and Material Handling Engineers and Massachusetts Institute of Technology featured more than the usual number of highly informative talks. Four of those talks are presented here by FLOW. Below, are the first-prize winners in the 1953 Protective Packaging and Material Handling Competition.

The Best Packages of 1953



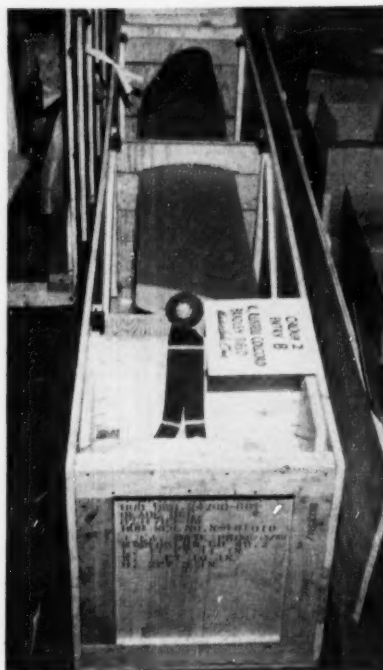
A double winner, one special award winner, and six first prize winners reflect trends in material handling and packaging.

Relationship Between Material Handling And Product Design

**R. F. Weber, General Supervisor,
M. H. Research
International Harvester Co.
Chicago, Illinois**

EARLY in the 20th century in most industries the development of new machines and products was the joint duty of the design engineers and production foremen. Designs and production operations had to be developed simultaneously because of limitation of productive processes. Very often, the plant superintendent also was the chief engineer. Many parts designs were suggested by mechanics responsible for the output.

I recall a large tractor which was designed in steps as it was built into a full-sized trial machine. As each piece was agreed upon by the designing and shop



DOUBLE WINNER

Harold Jackson Award—(for the export package offering the most satisfactory method of product protection against corrosion.)

and

Group II—(Nailed Wood Boxes and Crates).

Entered by K. Russell Colcord, Bradley Field, Windsor Locks, Conn., packaging engineer. Package is for shipment of propellers direct to user, both domestic and export. It offers freedom from damage and pilfering; distribution of weight; loss from damage is near zero since change was made to this container. Weight of the contents is 700 lbs., and shipping weight is 1150 lbs.

Material Handling Exposition

groups and manually produced, it was tried out. After many trials and errors, this first model was tested and required additional changes before turned over for quantity production.

As demand for manufactured products gradually increased it was necessary to develop design specialists separated from production operations.

Within the past ten years the position of material handling engineer has come into prominence. His job primarily is related to production.

Managements of many progressive industries have established training centers under competent instructors to teach all levels of supervision the scope of company operations. It is very evident that this kind of training does pay off.

I have observed as part of this trend of understanding a growing desire for product designing and manufacturing divisions to co-operate whole-heartedly in their respective fields of operation. The material handling engineer is a big factor in this co-ordinated effort, and I have every reason to feel assured that this relationship with the product designer will develop into a very essential and beneficial function of both groups.

(Continued on page 133)

Integration And Standardization of Handling Equipment

Nathaniel Warshaw, Manager, Material Handling Division, Market Forge Company, Everett 49, Mass.

THE two matters which I am going to discuss have been on my mind for many years. When you have been thinking and working constantly in one field for a matter of over thirty years you can't help but come to some definite conclusions.

Integration and Standardization are not synonymous words. However, you cannot achieve one without making the other a goal as well. First, we must start off by saying that Material Handling is different from any other industry. I believe its potentialities have hardly been tapped and that there is no other industry of such importance to our national economy.

One of the reasons it is so important is because

(Continued on page 116)



Irving J. Stoller Award—(for outstanding achievement in the development of interior packaging).

CORRUGATED CONTAINER originally entered in the Group I competition, (Corrugated or Solid Fibre Boxes). Designer of this package is Earl K. Gustin, Bendix Products Division, Bendix Aviation Corp.



Group I (Corrugated or Solid Fibre Boxes)

Entered by Henry H. Kelly, Westinghouse Electric Corp. Product packed is DB15 Circuit Breaker. This method provides greater product protection, keeps product clean, and reduces packaging costs 33%.

Industrial Packaging & Material Handling Exposition . . . Continued

Organizing A Packaging And Material Handling Research Program

Charles W. Smith, Associate Manager
McKinsey & Company, New York, New York

DURING the past twenty-five years, the field of packaging and material handling has experienced tremendous growth. New methods, techniques, and equipment have been developed in such profusion that the selection of a particular method, or combination of methods, that will provide the best possible solution to many types of problems now represents a major task.

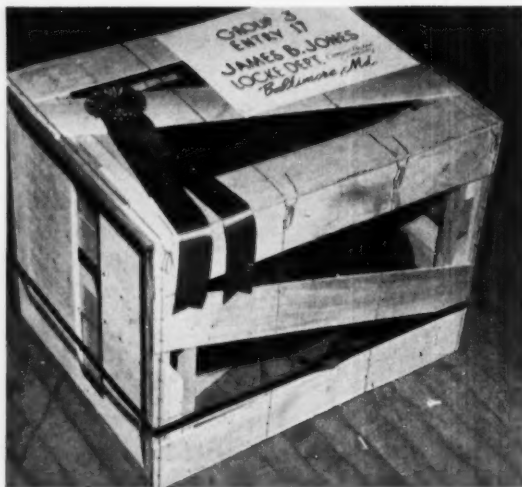
Nearly every company has found ways to cut costs, increase output, and improve customer service by improving packaging and material handling methods. Many other opportunities to effect major improvements still exist. Experience suggests, however, that full realization of these opportunities depends to a

degree upon the use of an organized, integrated approach to the problems that create the improvement opportunities.

In the great majority of companies, packaging and material handling problems have so far been attacked on an individual basis, in whatever order they have come to the attention of management. It is becoming increasingly important, however, to put individual packaging and material handling problems in proper perspective from an over-all company viewpoint so that they can be studied as part of an integrated research program.

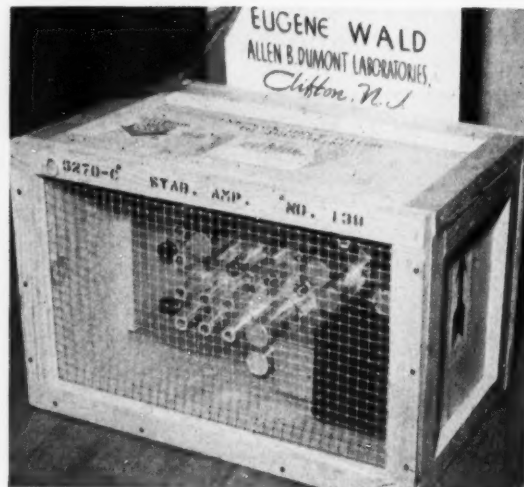
One reason for this trend toward the integrated approach is the fact that packaging and material handling problems typically involve more than one operating department. Another is the growing realization on the part of top management that partial solutions to basic packaging and material handling problems are not only expensive but may actually create more problems than they solve. Finally, the greater number of alternative methods is making the task of

(Continued on page 123)



Group III (Wirebound Boxes and Crates)

Entered by James B. Jones, Locke Dept., General Electric Co., Baltimore. Product packed is a power switch-bushing assembly. The package has resulted in a 42% reduction in packaging and shipping costs. The contents of the package weigh 100 lbs. . . . shipping weight is only 122 lbs. Dimensions of the package are 20 inches by 20 inches by 25 7/8 inches.



Group IV (Cleated Panel Boxes)

Entered by Eugene Wald, Allen B. Du Mont Laboratories, Inc., Packaging Engineer. The product packed is a stabilizer amplifier. The package consists of a cleated box with two sides of metal screen backed by a sheet of vinyl plastic film. The method prevents concealed damage, permits rapid packaging, and has resulted in a 100% reduction in damage.

Shock And Vibration

James A. Sargeant, Chairman, Army Packaging Board OACoS, G-4, Department of the Army

and

Henry Pusey, Physicist, Department of the Army Engineer Research and Development Laboratories Fort Belvoir, Virginia

THE purpose of this paper is to outline some of the problems encountered in packaging shock and vibration phenomena and to present briefly some approaches to the solution of these problems. The paper has been prepared strictly from the layman's point of view, and it is not expected to clarify all the technical points involved. It is hoped that it will provide a broader understanding of the problem.

The co-authors of this paper by no means consider themselves to be experts in the field. Mr. Sargeant has had sundry experience in packaging, shock and vibration. He formulated and developed the Corps of Engineers' packaging research program, and his first-hand experience has been that of general supervision and long-range planning. Mr. Pusey has been directly engaged in the Corps of Engineers Packaging research

program at Fort Belvoir for the past year and a half.

Shock and vibration rank in importance with corrosion as a factor in package design. Because of the large amount of damage caused by shock and vibration occurring during shipping and handling, the packaging engineer has become concerned with this problem. The seriousness of the loss depends upon the extent and nature of the damage to the item. This damage may range from complete breakage or destruction in the case of fragile items to a disturbance of calibration in the case of some electronic equipment. Therefore, the packaging engineer must develop means of preventing this damage by proper package design.

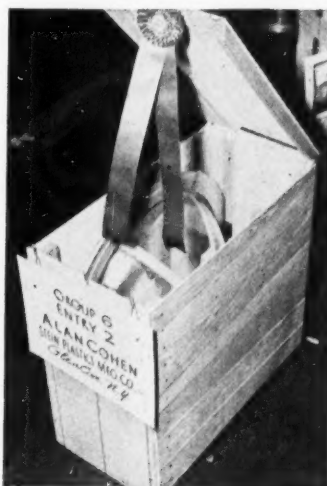
What must be known before the problem of providing protection to packaged items may be attacked? First, there must be a basic knowledge of shock and vibration phenomena and dynamics. Very simply, in the case of vibration, there must be an understanding of what is meant by amplitude and frequency. We must understand simple harmonic motion and know something about frequency analysis. In the case of shock, we must be able to work with such parameters as acceleration, velocity, impulse, and other associated quantities. With this knowledge, a knowledge of the characteristics of the items to be packaged, a knowledge of conditions that the packages will en-

(Continued on page 129)



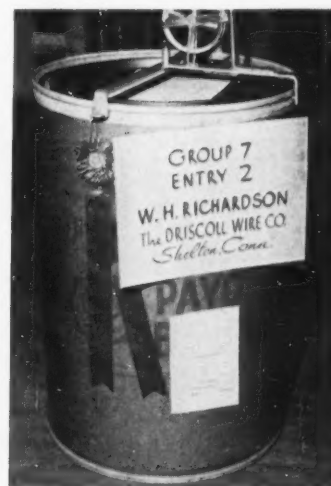
Group V (General Classification)

Entered by Julius J. Puchy, Weston Electrical Instrument Corp., packaging engineer. Package contains Navigational aircraft instrument mechanism. Method has resulted in cost savings of 69% and has greatly reduced handling.



Group VI (Export Containers)

Entered by Alan Cohen, Steiner Plastics Mfg. Co., Inc., purchasing agent. Product packed is a U.S. A.F. Navigator's Observing Dome. The new container is 60% cheaper than the old one. Contents weighs 20 lbs., shipping weight is 38 lbs.



Group VII (Material Handling)

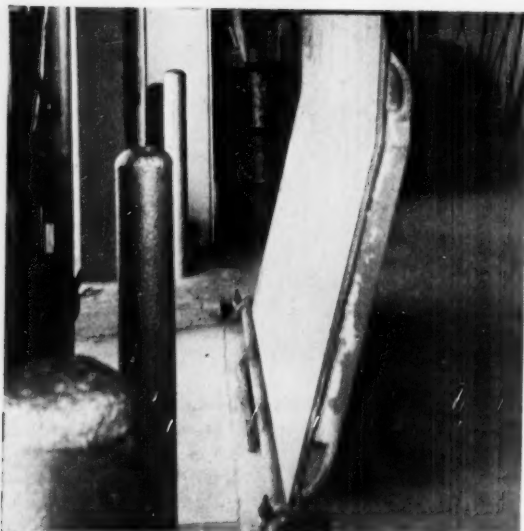
Entered by W. H. Richardson, The Driscoll Wire Co., vice president. Product is steel wire, and new method has greatly simplified dispensing. Also has reduced loss from handling damage and corrosion by approximately 20%.

FREE OF ALL OBSTRUCTIONS, the new terminal building of Associated Truck Lines, Inc., incorporates many ideas for speeding freight movement, and reducing handling costs. Here, permanently installed magnesium dock boards are raised. In opposite photo . . .



New Terminal Features

Safe, Fast Dock



HINGE ARRANGEMENT of bridge plates used on Associated Terminal's dock. Dry babbitt bearing eliminates maintenance problem. Hinge is special spring loaded type designed to reduce excess pivot play.



ONE-MAN POSITIONING is a feature of the light weight magnesium dock board. The terminal includes 35 loading doors like this one. Planning and good design have greatly reduced confusion during rush periods.



... DOCK BOARDS are lowered for loading operations. Note that regardless of difference in height between dock and truck, recessed construction makes bridge plates flush with floor. This is a good safety feature. Boards are easily dropped or raised by one man.

Handling

With safety and efficiency of operations as primary aims, Associated Truck Lines, Inc. designed and built a new truck terminal at Kalamazoo, recently. So well were the original aims of the trucking firm met, that the now completed terminal could well become a prototype of freight terminals of the future.

The design of the building, together with many of its installations, incorporates new ideas for speeding freight movement and reducing dock handling costs. The terminal is a one-story, rectangular structure with approximately 11,000 sq. ft. of unobstructed warehouse space. Thirty-five trailers can be spotted and serviced at one time at its docks.

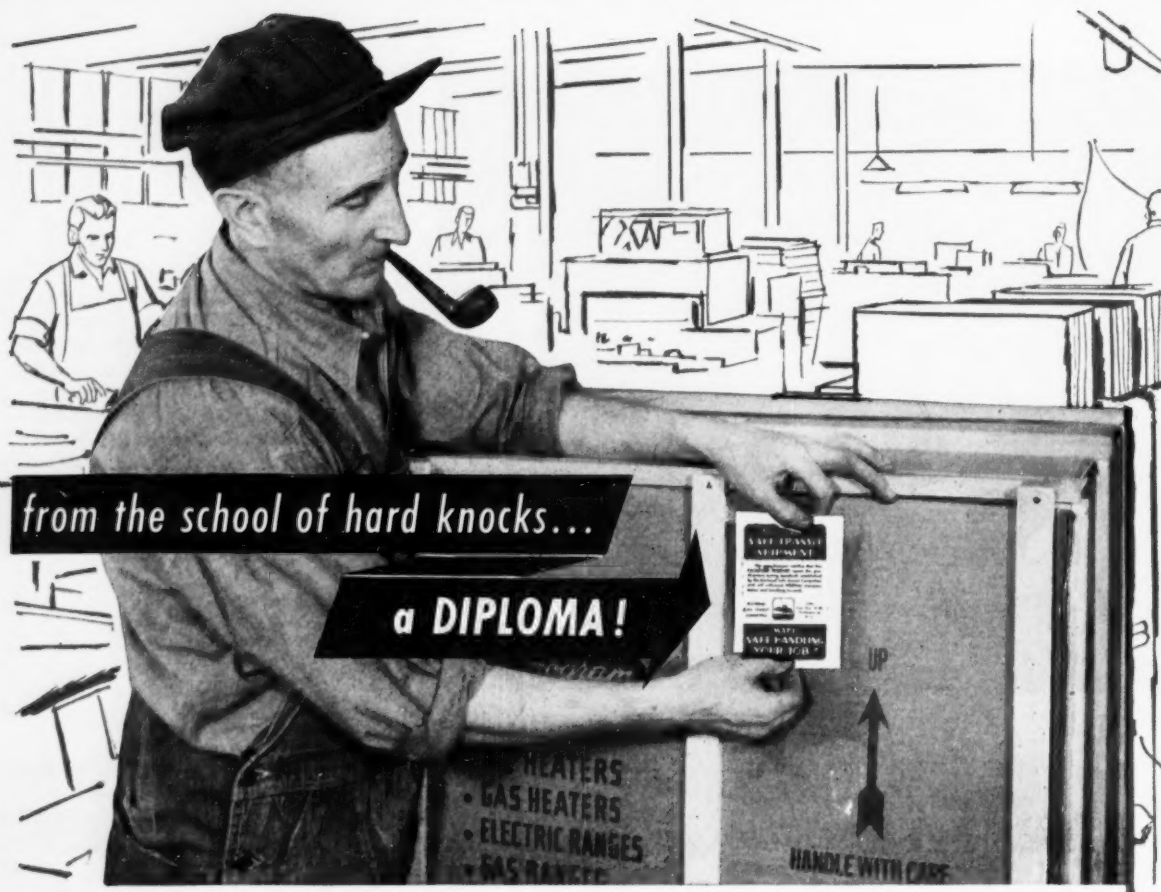
The thorough planning which went into the terminal building is quickly evident after a study of the specially designed, permanent type magnesium dock boards which were installed at each of the 35 loading docks. Each dock board can be lifted upward to a "stored" position when not in use and, just as easily, lowered to a level position when needed for loading. The devices are easily raised or lowered by one man, and are recessed into the concrete floor of the dock so as to be flush with the dock floor when in the down position.

Illustrations on these two pages clearly show the excellent design of the terminal, and describe operation of the dock boards which have contributed so greatly to lowered costs and increased safety.

Photos courtesy of Magline, Inc.



FORK TRUCK HANDLING is made easier through flared curb ends on the bridge plates. Sharp angle turns can be made with ease even when dock is cramped. Often part of turn is made on dock board.



and another sagging market gets a boost from General Packaging Laboratories

Quincy Stove Company, Quincy, Illinois, faced an actual drop in sales when their Monogram Oil Heaters started arriving at dealers' in a damaged condition. They presented their problem to General Box Company Engineers. Results:

- A Watkins-Type container, specifically designed to withstand heavy punishment and meet Pre-Tested Safe Transit Standards, was developed.
- The product itself was tested on General Box Company's exacting laboratory equipment; improved design corrected cause of failure.

In the three years since the changes were made, Quincy Stove Company's damage in shipment claims have totaled less than \$200.00. This is only one among many packaging problems solved every day—at a saving—in General Box Company's two fine Industrial Packaging Laboratories.* Let us help *you* cut packing and shipping costs. Write today for full information.

**For More Cost-Cutting Ideas, Write for your
Free Copy of "The General Box."**

*General Box Company Laboratory facilities are certified to make "National Safe Transit" tests.



General Box company

★ ★ ★ ★ ★

1857 Miner Street
Des Plaines, Ill.

Factories: Cincinnati; Denville, N. J.; Detroit, East St. Louis, Kansas City, Louisville, Milwaukee; Prescott, Ark.; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Shipping Containers for Every Shipping Need

Wirebound Crates and Boxes • All-Bound Boxes • Generalist Pallet Boxes • Cleated
Corrugated and Watkins-Type Boxes • Corrugated Fiber Boxes • Stitched Panel Crates

Circle No. 52 on Reader Service Card for more information

WHAT'S NEW... in Packaging and Shipping Equipment

"Rip-A-Tape"

A simple method for opening shipping cartons is made possible by Wolco "Rip-A-Tape", a red, reinforced gummed tear-strip tape made by General Gummed Products, Inc. The tape is applied by the carton manufacturer to the inside of the carton blank, leaving a convenient tab for ripping the box open. It can be applied with existing box taping equipment. Cited advantages are: 1. makes cartons easy-opening; 2. reduces damage to contents; 3. reduces injuries, since no knife is used in opening.

Circle No. 171 on Reader Service Card for more information



Counting Hand Stamp

Weber Addressing Machine Co. has developed a hand duplicator which not only provides a total of over 10,000 impressions on one stencil, but accurately counts impressions as they are made. The duplicator may be furnished with either one or two re-set counters. When two are used, one can keep a running total of all items marked for one shipment, while the other counts individual totals of different items. As impressions are made, a wire actuator extending from each counter is depressed and the count is registered.

Circle No. 172 on Reader Service Card for more information



Strip-Heated Wax Tank

Designed for small size dipping operations and low in cost, the ST-3 Bench tank is said to effect real economy in handling. It need only be plugged into any standard electrical outlet. It is described as being easily portable, ruggedly built and fast heating under thermostatic control with low current consumption. The unit is designed primarily for use in small parts wax dipping, but it will double as an efficient glue pot when necessary. It is manufactured by the Aeroil Products Co., Inc.

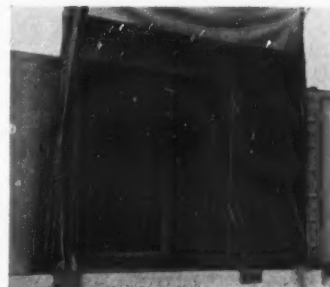
Circle No. 173 on Reader Service Card for more information



Shelter Where There is No Dock

Atlas Industries, Inc., has introduced a new model shelter that is designed for use where no unloading or loading dock is available. The shelter is mounted on a concrete abutment and provides complete protection to men and materials when unloading from a box car into a truck or vice versa. The shelter is a combination of standard scissor and outrigger dock shelters. The scissor part extends into the box car where it is fastened securely. The outrigger fits snugly around the truck. When not in use, the shelter folds neatly together, out of the way.

Circle No. 174 on Reader Service Card for more information





Earl B. Candell

S.I.P.M.H.E.

Elects New Officers



Stanley Price

THE SOCIETY of Industrial Packaging and Material Handling Engineers has announced the election of its national officers for the 1953-1955 term. New chairman of the board is Stanley Price of Western Electric Co., Chicago. The new president of the organization is Earl B. Candell, head of the packaging and material handling section, Lamp Div., General Electric Co., Cleveland, Ohio. Terms of office started Nov. 1.

Price is the retiring president of the society. The office of vice chairman of the board has been abolished and the by-laws of the society amended as follows: "The office of vice chairman of the board shall be eliminated and the duties of the vice chairman of the board shall be assigned to the chairman of the board." The amendment was passed at the August 31 meeting

of the society's national directors on the recommendation of the organization committee that the top level officership be streamlined.

Other new officers are: J. W. McReynolds, chief industrial engineer of Kraft Foods Co., executive vice president; L. S. Beale, Secretary-Treasurer of the Wirebound Box Manufacturers Association, vice president; A. C. McGeath, Sales representative of the American Box Board Co., vice president; E. P. Troeger, supervisor of materials and process engineering, Douglas Aircraft Corp., vice president; M. A. Grogel, Ekco Products Co., treasurer; and John Mount, Insurance Co. of North America, secretary.

As chairman of the board, Price succeeds Paul O. Vogt of General Electric Co., New York. Candell succeeds Price as president. McReynolds formerly was secretary.

Easy to use . . . Easy to clean
. . . Easy to service



DERBY SEALER

**MODEL 32
GUMMED TAPE
DISPENSER**

For Shipping Room and Production Line Packaging

● Rugged simplicity aptly describes the Model 32. Derby's exclusive, one-piece solid casting eliminates parts and provides added rigidity. What's more, the Model 32 is easy to clean, even during the hot summer months when machines tend to "gum-up."

● The Derby Model 32 accommodates any tape from 1" to 3" wide. Delivers from 4 inches to 34 inches of tape at one stroke.

● Derby's exclusive "moisture-control" system maintains a maximum high water level in the tank to assure a constant supply of water to the brush, no matter how fast tape is dispensed.

● Also available is the Model 32-T with tool steel shear-type blades for cutting reinforced strapping tapes. Blades have two cutting edges to double their useful life before resharpening.

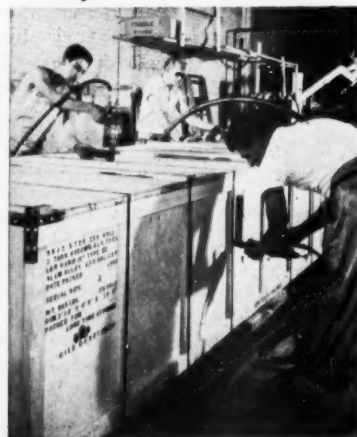
For further information, write Dept. F

DERBY SEALERS, INC.
Derby, Connecticut



Circle No. 39 on Reader Service Card for more information

POWER-LINE STAPLERS Speed Production



Strapping over steel banding on wooden boxes for export shipment, using AS-6 Power-Line Air Stapler. (F. P. Fletcher and Sons, Pasadena, Calif.)

Staples straddle the strapping, preventing slipping of band. This method meets all government specifications for export packing.

Power-Line Air Staplers are light-weight, simple to use, easily adjusted to assure correct penetration. They speed shipping operations, reduce labor costs. Power-Line Hand Staplers also available for this operation. Write for literature.

POWERS WIRE PRODUCTS CO.

P.O. Box 216 Monroe, Mich.
1590 Monterey Pass Rd.
Monterey Park, Calif.
Sales representatives:
Chicago—Memphis
New York—San Francisco



Circle No. 95 on Reader Service Card
FLOW • DECEMBER, 1953

"Jet" Taper

Better Packages announces a special 500 series Counterboy model designed specifically for Jet Tape. This tape is manufactured with a single strand of



string embedded in the glue side for easy opening. The Counterboy Jet Taper, in addition to regular Counterboy Adjustable Moistening Control, has the ability to dispense and cut a tab in the end of the tape strip. This allows the string embedded in the

tape to be grasped and torn through the tape for easy opening of the carton. This model can be adjusted for widths from 2" to 4". For selective or repeat measuring from 4" to 50".

Circle 176 on Reader Service Card for more information

Self-Sealing Protective Wrap

Spot-Seal is the name of a protective wrap announced by Sherman Paper Products Corp. It is a coated wrap that sticks only to itself. It is only necessary that the material be wrapped around an object, and the edges pressed together to give a sealed package.

Circle 178 on Reader Service Card for more information

Low-cost conveyor attachment marks cartons, cases automatically



Save man-hours now used for manual marking. Attach a ROLACODER Imprinter to conveyor or case-sealer and eliminate the cost of stencilling or rubber-stamping. Get neater, cleaner, more accurate marking, too. Friction-operated, self-inking. Copy changes made in minutes. Pays for itself in weeks.

Write for ROLACODER brochure showing models to imprint top, sides of every kind of package.

ADOLPH GOTTSCHO, INC.
Hillside 5, N. J.



Circle No. 59 on Reader Service Card for more information
FLOW • DECEMBER, 1953

Only FIBREEN

TAKES THIS BEATING...



...and COMPLETELY PROTECTS YOUR SHIPMENT!

For shipping metal goods, textiles, furniture, leather, rubber, wood products, foods in containers, etc.

Fibreen gives you

- **Protection against rough handling**—Rugged Fibreen resists rips, cracks, and punctures— it's reinforced with tough, closely cross-laid fibres of steel-like strength.
- **Protection against water and moisture**—Double-layers of highest quality, water-proof, pliable adhesive prevent moisture penetration.
- **Protection against dust and grit**—Both top and bottom sheets are surface-treated top-grade No. 1 Kraft.

—and Fibreen is

- **Easy-to-handle**—It's flexible and is quickly formed around contours. Saves time and labor.
- **Light weight**—Makes a compact package—reduces shipping and storage costs.
- **Low in cost**—Available in widths of 36", 42", 48", 54", 60", 72", 84", and 96" ... also with a new non-asphaltic adhesive.

SEE FOR YOURSELF! Send for free samples of Fibreen—specialized for different shipping problems ... in asphaltic and non-asphaltic grades. Test them yourself! If you'd like a free 28-page book covering packaging methods in almost every industry, please indicate. Write Dept. F-12



A product of
THE SISALKRAFT CO.
Chicago 6, Ill.

New York 17, N. Y. • San Francisco 5, Calif.

Circle No. 111 on Reader Service Card for more information



Three-room aluminum house arrives on site in 6 two-man bundles —

A tribute to the packaging magic of Signode's tested steel strapping methods!

Here is another laudable example of Signode's ability to adapt *basic unitizing methods*—even to difficult-to-pack-and-protect bundles!

This three-room aluminum house—complete except for windows, doors and floors—was packaged KD for both domestic and export shipping in 6 easy-to-handle bundles!

What about your own packaging and shipping methods? Would you like to improve them to gain greater security and more economy? Perhaps the proper application of this *unit bundling method*—as recommended by Signode—will be the answer you've long sought.

Find out now! You can ask a Signode fieldman to call without feeling obligated in any way. Write today to Signode Steel Strapping Co., 2618 N. Western Ave., Chicago 47, Ill. Offices coast to coast. In Canada: Canadian Steel Strapping Co., Ltd. Foreign subsidiaries and distributors world-wide.

SIGNODE Steel Strapping Co.

SEND FOR FOLDER SHOWING 6 BASIC WAYS OF UNITIZING
Circle No. 109 on Reader Service Card for more information

INTEGRATION . . .

(Continued from page 107)

of its importance in the cost of distribution. When we all awake to the fact that it is beginning to cost more to deliver and handle an item during manufacture and on its way to the consumer than it cost to make the item, we can realize how important anything is that is a large part of the total cost.

As you know, our economy is divided into two groups; those who produce and those who do not produce. No where in the world is there an economy where the second group is so large and probably outnumbers the first. When the Communists say that Capitalism carries in itself the seeds of its own destruction they may or may not be referring to the above fact but they no doubt recognize it. We have taught the Communists a lot! Through us they have pretty well mastered the art of mass production—at least on items they want to mass produce. One of the penalties of our Democratic form of Government is that we do our thinking out loud and friend or foe can benefit by it.

I know nothing of the Communists' Material Handling methods and how they treat this matter but I do say that we had better master this situation before they do or their prediction will come true. The handling of materials in military logistics is well recognized. In fact, Material Handling is almost synonymous with logistics as it emphasizes the importance of getting there "fustest with the mostest." However, of perhaps the greater importance is what the combination of low production cost plus the low distribution cost will accomplish in international trade.

So the problem is—how can we get more production and lower cost distribution by material handling. One way is to "Standardize" and to "Integrate".

The unfortunate feature of the Material Handling Industry is that it grew up before we knew it and



**Top and Bottom
Closing Pays
Packaging
Dividends
at Candyland**

with an International Stapler

At the immaculate Candyland plant in Sioux City, Iowa, "women in white" pack a steady flow of gaily colored bags of soft marshmallows. INTERNATIONAL Stapler Conveyor Unit pays packaging dividends—closing 400 cartons per hour, stapling tops and bottoms in one simple operation.

Here is another example of INTERNATIONAL Stapler's packaging versatility. Like thousands of INTERNATIONAL Staplers now serving all types of industry, this unit provides clean, secure closing at high speed—at lower cost—under rigid sanitary conditions.

Says Mr. Nathan Cohen, President of Candyland: "Since its installation, we have never had a packaging bottle neck. The girls in our packing depart-

ment operate INTERNATIONAL Staplers easily. We feel that our money was wisely invested."

Like all INTERNATIONAL Staplers, this unit occupies minimum floor space and allows complete operator freedom. It's simultaneous top and bottom stapling action, available only in INTERNATIONAL Stapler equipment, offers outstanding time and motion economy.

As Mr. Cohen says: "This INTERNATIONAL Stapler handles our packaging requirements quickly and surely. We recommend this equipment to any manufacturer with similar packaging problems"

You will find 20 models ready and able to cut your packaging costs and build your profits. Investigate INTERNATIONAL Stapler Equipment now. Ask for Bulletin C/201 covering the full line.

Package for profit . . . use genuine International Staples for faster, finer closures.

a seal of security —



INTERNATIONAL STAPLERS

International Staple & Machine Company
808 East Herrin Street, Herrin, Illinois

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**PACKED IN HALF THE TIME
And Costs Reduced by 80% !**



It was no simple job for Standard Die Set Manufacturers, Providence, R. I., to ship heavy die sets, some weighing as much as 3000 lbs. Wooden boxes had to be well blocked to prevent shifting. Covers had to be nailed down, boxes strapped for extra strength.

Now by using the Stanley Steel Strapping System, the die sets are simply wrapped in heavy paper

and bound to wooden pallets. No nailing, no blocking, no boxing. 80% saved in packing costs, 50% saved in packing time. And so rigidly are the sets held in place that there hasn't been a single damage complaint!

Why not see how much the Stanley Man can save you. He'll install the Stanley Steel Strapping System on a 30-day trial. No obligation. Just mail the coupon below.

STANLEY STEEL STRAPPING SYSTEM



***A MAN** thoroughly experienced in steel strapping applications — the Stanley Packing and Shipping Engineer.

A METHOD adaptable to any requirement — the Stanley Steel Strapping System, with representatives in 32 principal cities.

**HARDWARE
TOOLS
ELECTRIC TOOLS
STEEL STRAPPING
STEEL**

THE STANLEY WORKS, Steel Strapping Division
202 Lake St., New Britain, Connecticut

- ☐ Yes — the 30-day trial interests me. Have the Stanley Packing and Shipping Engineer call.
- ☐ Send me complete information about the Stanley Steel Strapping System.

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INTEGRATION

Continued

there was not too much engineering analysis given to the different elements. There is no point in crying over spilt milk but on the other hand there is no point in continuing to spill it. I know one thing for sure and that is that one man or group of men cannot put over standardization in this industry. I also know that several groups have been working on standardization of certain elements for some time. Their accomplishments have hardly created a ripple and this is not due to lack of sincerity or effort. It is due to the immensity of the task and the lack of public concern. That is why I did not hesitate to use this as my subject when I was asked to speak here.

You as a group would not be here if you were not vitally interested in material handling. Who knows but one among you may generate the right spark to accomplish more than has been done already. Perhaps this organization itself may become a driving force in this matter. Perhaps the great school which sponsors this course will add it to other great tasks it has accomplished. Actually, this seems to me of such importance that our Federal Government should take every means possible and use all the influence possible and insist on cooperation by all the different parties involved.

The situation reminds me of the man with the leaky roof. He could not fix it when it was raining and he didn't need a tight roof when the sun was shining! We couldn't do much to standardize intelligently during the war years and the importance of standardizing is forgotten in other years. As a matter of fact, you will recall we were forced to a certain amount of standardization during the war but it was only "for duration" and most of the good has disappeared with the not so good.

We all know what standardization has meant in the automotive industry but this was relatively easy because one industry with a common goal was involved. The

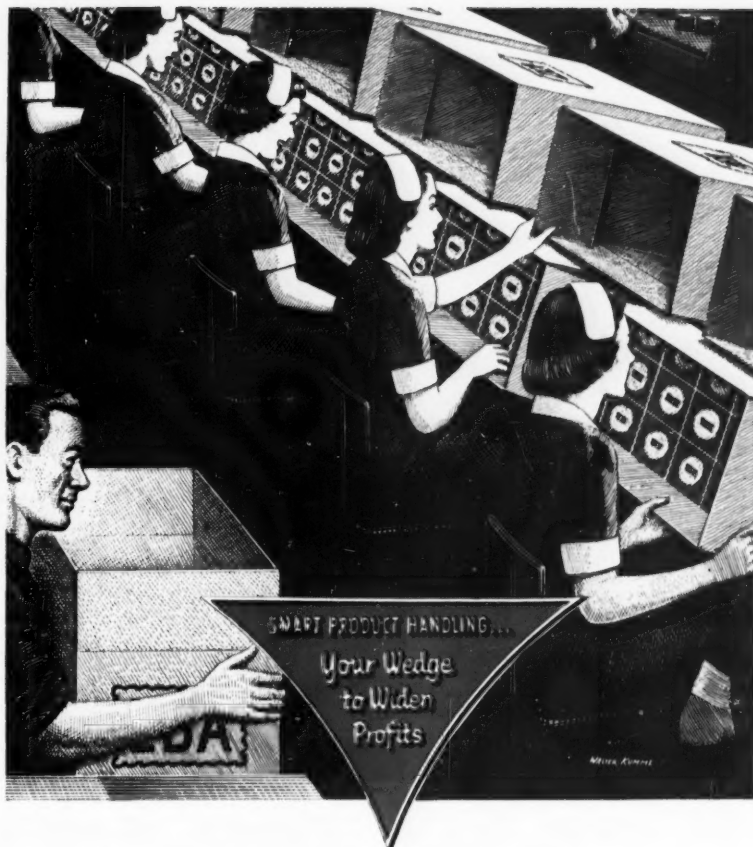
same with the electrical industry.

If you adopt certain standard, basic size packages—you then can use standard cartons and these will determine the size of the pallet, skid, truck, conveyor, and so forth. This is wonderful but do the manufacturers of pallets, skids, floor trucks and conveyors, know what you are doing and are they taking advantage of it in standardizing their product? I know that the Navy has done a great deal along this line and now uses only two size pallets; a 40x40 and a 48x48 which in turn means only two sizes of pallet lift trucks, one with 40" forks and one with 48" forks. If this is good for the Navy isn't it good for Industry?

Who Will Bell the Cat?

Could pallet manufacturers and pallet truck manufacturers adopt these as standard and because of the greater volume of these sizes lower their prices on them which would induce further use? They could and they would but what benefit will result if they must still furnish all the other sizes at the whim of the purchaser who may be buying them through ignorance or being sold them through ignorance? Something should be done about this right away. Delay merely deepens the hole we are in. But who is going to bell the cat? Who is going to say this is and this isn't standard?

What an opportunity was missed when the hand lift truck was invented and its use first promoted! The original manufacturer decided a 6" lift truck was adequate. The next fellow decided a 7" truck would pull easier. Along came someone else who figured he would jump the gun and give a 9" truck. Then along came others and said—let's integrate but our wheels won't stand up unless an eleven-inch wheel is used and so the eleven-inch size was born! . . . and all this while each manufacturer was losing his original advantage because they each began making 6"-7"-9"-11" trucks. What stupidity we say now! But then they did not realize! They did not know how great this industry would



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The more efficient you make your packing operations, the more costly every interruption becomes. That's why every Gaylord box is precision-made to exact specifications . . . to assure smooth, continuous operation without jamming or sticking. Very often, the money saved by this increased efficiency in packing more than pays for any difference in original box cost.

Whatever the size, shape or type of container you need, if it's Gaylord-made you can be sure that it will help develop top efficiency in your packing system.

For information and cooperation, phone your nearby Gaylord office. You'll find it listed in the phone book.

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Others claimed these products "Too large and heavy" for wirebounds, but American special designing and manufacturing facilities met the challenge. Result: "King-Size" Wirebounds. Each weighs 35 lbs. less than former hand-made nailed-wood crate and costs less to produce in quantities.

New American "King-Size" Wirebounds cut weights Carry Larger, Heavier Equipment at Lower Cost

What are "king-size" savings? One hundred of these American Wirebound Containers, replacing nailed-wood crates, saved 3,500 lbs. shipping weight. Convert pounds into dollars and you **begin** to see what we mean. The rest of the story includes economies and conveniences at **every** packing and handling level.

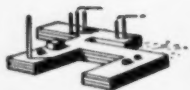
Product weight: 3,000 lbs. Crate size: 63"x93"x39". If your product nears these specs, and is packed in a hand-made nailed-wood crate, American "King-Size" Wirebounds are for **you**. They're safety-engineered against all shipping hazards; simplify packing, unpacking, handling, storage; and **cost you less**. Avoid the needless expense, headaches and "hidden costs" of building your own crates. Send your product for a "sample" packing and "quote". No cost or obligation.

★Thousands of acres of timber, three veneer mills, two great plants in Cleveland, Ohio, and Marion, S. C.

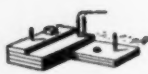
THE American BOX CO.



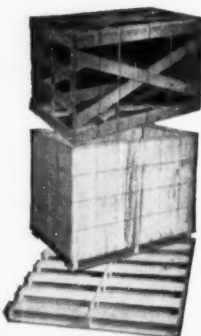
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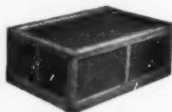
Phone: SU 1-5200



Marion,
South Carolina



American Wirebound Crate,
Tote Box, Pallet



American Fibreboard Box



American Nailed Wood Box

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INTEGRATION

Continued

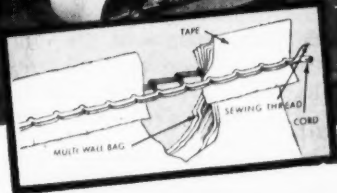
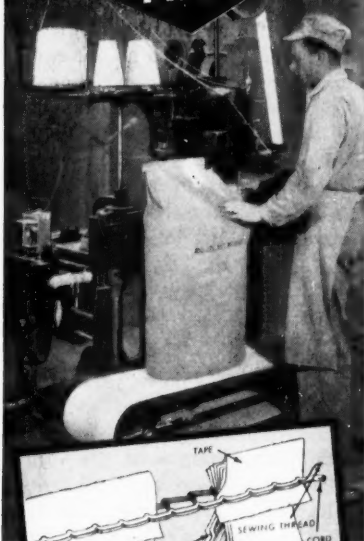
become! Most of them thought they were making a nice profitable specialty that might develop into a fair size business. The stupidity exists now! The power truck industry can furnish suitable wheels of any reasonable size. There is positively no excuse for using these four sizes of trucks and skids any longer. If a standard lowered height is set for a lift truck, their costs will be reduced, the skid platform costs will be reduced, the power truck costs will be reduced, the cost of wheels will be reduced and more important than all these, we will achieve integration in handling these units and more goods will be shipped and stored on skids than ever before at less cost.

Outdoor transportation—motor trucks, railroads, ships and planes will use the same size unit that indoor transportation in industrial plants, warehouses and sales outlets use. It is just as simple as that! But who is going to say again what is standard! It's just as Mark Twain said—"Everyone talks about it but no one does anything about it." Do you know what happens when there is no standardization? Well, one very large company that made a certain type of wheel for manufacturers over a period of 30 years threw up the sponge about two years ago and stopped making these wheels entirely. I know one of the paramount reasons was the terrific variation in sizes between 4" diameter and 10" diameter, the terrific variation in width of face between 1½" and 4"—and, of course, the *large* number of *small* orders!

As far as I know no one bought this business—in fact, I don't believe they are able to give it away! A little later one of the larger rubber companies discovered a similar disturbing fact in their manufacture of industrial truck wheels, large variety of diameters, face widths, and bores—so many combinations in fact that storage facilities for all the various molds

Tape-Bound Closures for Multiwall Paper Bags!

**LOW-COST
SECURE
FAST**



UNION SPECIAL Style 21800 H Bag Closing Machines, with 80600 H sewing heads, shown here, are heavy-duty, high production units for making low cost tape-bound closures on large multiwall paper bags.

A single foot pedal controls synchronized conveyor and sewing head. Automatic tape cutter on sewing head saves time and helps make operation smooth and easy to learn.

Sewing head and conveyor are quickly adjustable for varying bag heights and scale or platform height from floor. Entire unit is ruggedly built for dependable service in high-volume production.



Ask for a copy
of this Bulletin

It's easy to find just the right unit to meet your individual needs in Union Special's big line of bag closing machines. Ask for a copy of Bulletin No. 200, "UNION SPECIAL FILLED BAG CLOSING MACHINES"

Union Special
MACHINE COMPANY

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INTEGRATION

Continued

became a real problem. They, too, discovered a tremendous number of small orders! They, too, threw up the sponge but for some reason re-considered and are still manufacturing. They probably were impressed with chaos that would result in all industry if they terminated their manufacturing operations on rubber wheels suddenly. I wonder how many of you here knew about these two situations. It wasn't even mentioned in the least important pages of any newspaper! Certain of these many many wheels should as quickly as possible be named standard. The public should be notified, the schools should teach, the manufacturers should point them out. Volume of the standard wheels would go up, prices would go down and again integration would result and maintenance men the country over would bless us for ever and ever.

SAVE 20%
on sealing costs!



"Dial" gummed tape electrically

The new Marsh Dial-Taper is real news to users of gummed tape. Dispenses all kinds, in widths to 3", electrically. Select your length on the telephone-type dial, dial it, and out it shoots moistened with warm water. Sticks instantly. Saves 1/5 on tape, often more in man-hours.

For more information or a free demonstration mail us this ad with your name and business letterhead

MARSH Electric
Dial-Taper

MARSH STENCIL MACHINE COMPANY
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Why not **PRINT** and
ADDRESS your
labels in one
operation?



The Weber KC-E
Label Printing
and
Addressing
Machine

SOLVES MULTIPLE ADDRESSING PROBLEM. SAVES COST OF PRE-PRINTED LABELS.

How long does it take one girl to prepare 50 shipping labels with the same address and shipping information? 5, 8, 10 minutes? The Weber KC-E machine will do it in 30 seconds and will print the label form at the same time! Multiply these savings in time, labor, and material by the number of quantity shipments you make each week and you'll immediately see why this modern machine is in such great demand.

If your company is now preparing quantities of shipping or product identification labels with the same information, whether it's 25, 50, or 1,000 labels at a time, it will pay you to investigate the advantages of the Weber KC-E. A "trial-rental" plan offers you the opportunity of giving the machine an on-the-job test at a nominal cost.

Weber

LABEL AND MARKING SYSTEMS
Division of Weber Addressing Machine Co.

Mail coupon for free sample
packet of labels printed by KC-E
Machine and detailed information.

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☐ Send sample labels and more information.
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NEW! REVOLUTIONARY!

**Cycle Numbering
and Marking
ROBOT**



Automatic multiple marking unit . . . installs on production line. Prints in cycle: dates, code numbers, serial numbers, groups of numbers in combination . . . in various positions . . . on products, cans, containers, packages, cards, etc. Write for specification sheet and catalog.

Mounted on platform with automatic slide for multiple numbering of work cards.

WM. A. FORCE
& COMPANY, INCORPORATED
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INTEGRATION

Continued

One last case of standardization and integration; industrial casters. Why can't more casters by various manufacturers be interchangeable? Progress has been made by each manufacturer to increase his business among his competitors' customers, by merely adopting his competitors' dimensions. The result is that almost every caster manufacturer can duplicate each others mounting dimensions. The difficulty is that no one size or sizes are called standard by the industry. Some buyers are becoming aware of these facts and taking advantage of them and have achieved standardization and integration in their own plants. They have not, however, benefited greatly from the power prices bound to result if all manufacturers handled fewer manufacturing orders for large quantities.

Far-Reaching Possibilities

Material handling equipment, to give complete universal service, must be capable of integration. We naturally think of skids and lift trucks, pallets and fork trucks, tractors and trailers. However, we are beginning to realize that integration does not stop there. There are great possibilities with tractors, trailers and pallets, tractors, trailers and portable elevators, lift trucks, skids and conveyors. Besides

NEW HEAVY-DUTY CART



WITH "3-POINT LANDING"

Here's just the cart you need for wheeling coal, scrap, chips, turnings, borings and similar heavy materials. All-steel, completely welded and reinforced. Made extra strong and rugged for heavy duty service. Dumps easily. Rests securely in any one of the three positions shown here. Available with roller bearings, if desired.

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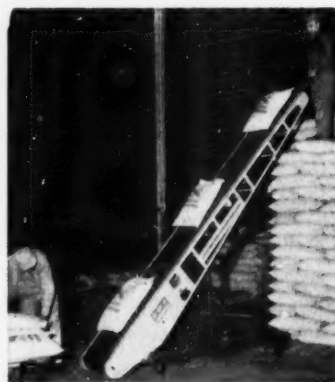
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Sterling
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Look for this Mark of
STERLING Quality

ELTON CONVEYORS



**HAVE PROVED THEMSELVES
IN OVER 1500
INSTALLATIONS**

Advanced features, such as, power lift mean higher capacity at lower cost.

Write for Our Catalog.

It contains information on portable conveyors up to 35 feet. Light duty conveyors, stationary and intra-floor units in various belt widths and lengths. Dealer inquiries invited. Sell this popular line.

CHANTLAND MFG. CO.
BADGER, IOWA U.S.A.

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FLOW • DECEMBER, 1953

INTEGRATION

Continued

these possibilities we must think of integrating indoor transportation with outdoor transportation. Skids, pallets, and floor trucks must fit properly into motor trucks and freight cars. There are even new types of vessels being built with rolling decks allowing direct stowage of pallets, etc., on each deck without unloading them and easily accessible.

By and large, therefore, the importance of standardization to permit greater economy in handling cannot be disputed. The big question is How? No one, frankly, seems to have the answer yet. The problem will not be solved by avoiding the issue. I may be wrong but I sincerely believe that only by frequent and constant discussion at meetings of this sort, in our trade magazines, at industrial association gatherings etc. will the

barrier which is preventing this important step being taken be lifted. If I have through this talk brought home to you personally this crying need in our American economy I will be amply repaid.

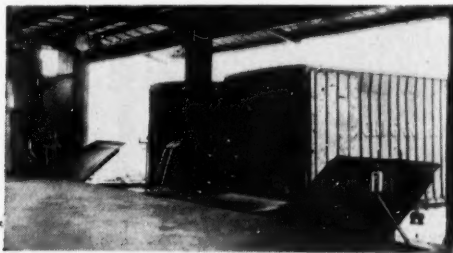
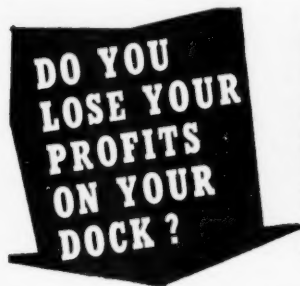
RESEARCH PROGRAM . . .

(Continued from page 103)

choosing the best method or combination of methods for solving any given packaging and material handling problems increasingly difficult.

Steps Involved in Integrated Approach

When a company is large enough to have a packaging and material handling engineer on its payroll, the problems involved in securing the cooperation of various line operating departments provide a basic reason for developing an integrated research program. In smaller companies, the integrated research program is

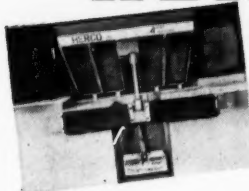


4 Herco dock installation at Novi Equipment Co., Novi, Michigan

You can lose money and profits just as easily in slow, wasteful handling on your dock as in your plant—and it's all part of your production costs.

STOP PROFIT LEAKS -- CUT HANDLING COSTS with a

HERCO DOCKBOARD



Adjust up—down—left—right in seconds.
Positive lock in UP position; automatically follows carrier level in DOWN position.
Patented spring action counterbalance automatically adjusts weight to dock.
Economical to install in old or new docks.
No maintenance required; hardened gears give lifetime service.

2 sizes—48" x 72" and 60" x 72";
20,000 and 30,000 lb. capacity
in both sizes.



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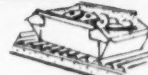
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COMPARABLE TOTE BOX!

Cut production costs! Use the new RANtote "877", designed to "take it" under heavy abuse. In gruelling laboratory high-compression tests, stacked RANtotes withstood 5,000 lbs. of pressure with no resultant damage! Proof to YOU that RANtotes last longer—cost less!

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THESE Handling ADVANTAGES



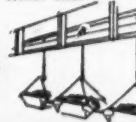
Lightweight, reinforced construction—10 lb weight facilitates calculation of tare and ease of handling.

RANtotes self-center, self-lock for safe transport. New hinged rail design eliminates "jamming," permits higher, safer stacking.



RANtotes nest when empty, stack when filled, with all parts visible and accessible from either end.

A natural for any conveyor. Eliminates parts transfer from one container to another.



RANtote
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It's a three-motor, floor-controlled crane suspended from three I-beams. Note that the bridge clears the side columns by mere inches.

This permits the trolley to travel unusually close to the walls affording maximum use of the floor area.

There is a Euclid Crane to handle all conventional and unusual operations—or we'll design one to do the job.



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ADD LIVELY SWING-SHIFT (hydraulic fork control) VERSATILITY TO YOUR LIFT TRUCK

- Eliminate all non-productive maneuvering
- Turn corners in tight areas
- Stack higher—faster, safer—with precision
- Increase lift truck output, reduce operating costs, add tire clutch & motor life

UNITS AVAILABLE FROM 3,000 TO 15,000 LB. CAPACITY

See Your Lift Truck Dealer or Write

SWING-SHIFT MFG. CO.

DESIGNERS P. O. BOX 957 FABRICATORS
LONGVIEW, WASHINGTON

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Who designed your NEW 160 foot CONVEYOR?

We did, right from the **Barber-Greene REDI-FAB CATALOG**

The B-G Redi-Fab series meets the needs of 2 out of 3 permanent conveyor installations

see your B-G distributor or write

Barber-Greene
AURORA, ILLINOIS, U. S. A.

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RESEARCH PROGRAM

Continued

equally important because it provides company executives with a basis for deciding when and how best to make use of the services of outside specialists (such as equipment salesman and consultants).

Whether a company is large or small, however, the organization of an integrated program of packaging and material handling research involves essentially just three steps:

1. *Define your company's packaging and material handling problems in general terms*, summarizing briefly what the company stands to gain from the solution of each problem. This advance sizeup will provide company executives with a basis for deciding what research investment, if any, can profitably be made to solve each problem.

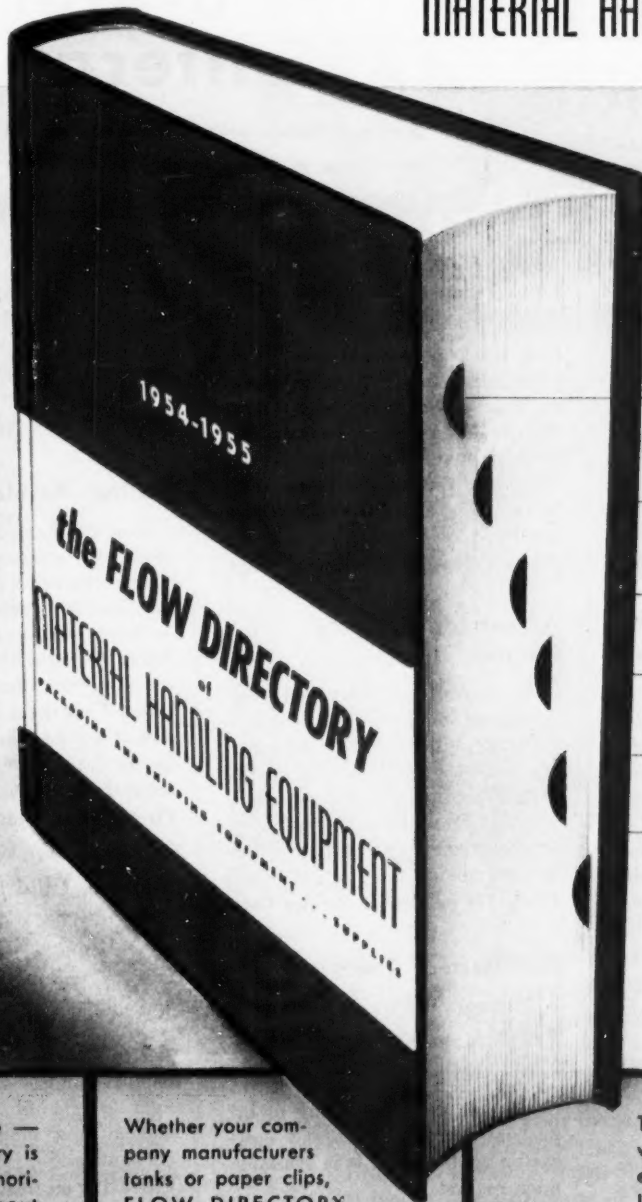
2. Once a decision has been made to undertake a particular research project, *designate one responsible executive to administer the project*. This executive should have sufficient authority to take whatever action is called for to develop a plan for conducting the study.

3. *Prepare a written project plan* whenever a research project involves more than one company operating department, or requires the employment of outside specialists. Such a plan should state clearly the objectives of the study, the steps to be taken as precisely as possible, and the extent of responsibility of each participant. Whenever it is practical to estimate costs in advance, a tentative budget should be set up as a basis for controlling expenses.

Stated simply, the integrated approach merely involves making sure that all aspects of a packaging or material handling problem are considered so that any solution that is developed will be sound from an over-all, long-range company viewpoint.

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THE ALL NEW 1954-1955 **FLOW DIRECTORY** of MATERIAL HANDLING EQUIPMENT



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DATA

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TRADE MARK INDEX

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your own library of authori-
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A beautifully illustrated eight-page folder released by the Baker-Lull Corp. presents complete specifications for its new 4-wheel drive Shovel loader. The powerful tractor unit has a 1½ cubic yard scoop capacity. It is said to operate easily over rough terrain and has 4-wheel power steering to increase maneuverability.

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Dumping Tractor:

Kalamazoo Mfg. Co. has issued its bulletin No. KT-3 which describes the Kal-Truk, a powerful and versatile small tractor unit with a dumping body. It is said to be ideal for construction jobs because it can climb ramps easily, pour wet concrete or haul gravel and sand. An interchangeable steel platform can replace the dump body so that flat stone, brick or other material can be transported.

Circle 186 on Reader Service Card

Magnesium Barrel Skid:

A colorful catalog sheet giving specifications of all models of the lightweight magnesium barrel skid may be obtained from Magline Inc. All sizes are rated at 800 pounds capacity. Traction grip rubber truck rests or heavy duty truck bed hooks are optional. Said to be 75 percent lighter than comparable skids made of other materials, the lightness of magnesium means no sacrifice in strength.

Circle 187 on Reader Service Card

Gas Versus Electric:

The age-old argument among fork truck manufacturers and users alike has had some more coals added to the fire with a new fact folder released recently by Lewis-Shepard Products. Available upon request the folder contains many new aspects on the question.

Circle 188 on Reader Service Card

Adjustable Loading Ramp:

An eight-page folder picturing numerous applications where the Rite-Hite adjustable loading ramp has solved dock handling operations is available from the Loomis Machine Co. Bulletin 953 provides diagrams and specifications of the various models.

Circle 189 on Reader Service Card

For Battery Users:

"Storage Battery Power" is a widely circulated publication available each month from the Thomas A. Edison Inc. In it are interesting facts pertaining to industrial battery usage and cost-saving applications. It is available upon request.

Circle 190 on Reader Service Card

Truck Casters:

A new 80-page truck caster catalog has been published by Faultless Caster Corp. New additions to the Faultless line are included in the catalog No. 157 just released. It is divided, too, into sections for easy reference in light duty, medium duty, heavy and

special duty casters. An exclusive feature of the catalog is the simplified guide to caster selection designed and sized for specific duties.

Circle 191 on Reader Service Card

Ceiling Maintenance Lift:

How the hazards and excessive costs of overhead maintenance can be eliminated is illustrated and described in a new bulletin issued by Barrett-Cravens Co. on its Lift-A-loft, a high lift electric truck. It takes the maintenance man, with all his tools, from job to job and up to the ceiling, placing him in the best position to perform the task at hand.

Circle 192 on Reader Service Card

Manual Chain Hoist:

The Yale Load King hand hoists with capacities from one-half to two tons are described and illustrated in Bulletin P-125A is available from the Yale & Towne Mfg. Co. The eight-page booklet emphasizes the unusually light weight of the hoists—the one-half ton model weighs only 36 pounds.

Circle 193 on Reader Service Card

2-Way Radio Data:

Ten new bulletins have been released by the General Electric Co. covering various models of two-way radio communications equipment. Six base station combinations and four mobile combinations are covered in the literature.

Circle 194 on Reader Service Card

Metal Parts Container:

Bulletin No. 500 has recently been released by the Brummeler Steel Products Corp. illustrating its entire line of steel parts containers, stacking boxes, hoppers and skid bins.

Circle 195 on Reader Service Card

All-Purpose Pallet Dolly:

Easy steering pallet dollies, light weight pallet dollies, and heavy duty floor-protecting dollies are described in an illustrated bulletin just released by Samuel Olson Mfg. Co. Inc. Also included in the literature is information on refrigerator car pallet dollies and roller ramps.

Circle 196 on Reader Service Card

Overhead Doors:

A complete informative and profusely illustrated booklet has been released by the Kinnear Mfg. Co. describing its line of Rol-Top doors for industrial use. Detailed drawings and photographs are included to enable readers to select the proper type door for their plant or warehouse.

Circle 197 on Reader Service Card

Trucks Versus Costs:

A colorful piece of literature has been produced by the Towmotor Corp. showing its complete line of industrial truck models and allied attachments designed to cut down material handling costs and reduce the man hours required to perform every production or manufacturing operation. The bulletin is numbered DM53-3.

Circle 198 on Reader Service Card

Heavy Duty Floor Truck:

All steel and hardwood construction of the Roustabout hand truck is explained in literature available from Standard Mfg. Co. Optional equipment includes molded-on rubber tires and automatic couplings for assembling trailer trains.

Circle 199 on Reader Service Card

GAS ECONOMY ?

1 gallon per hour!

first of
COLES
CRANES



Bonus FEATURES

COLES advanced engineering with Gas-Electric design reflects the continuous study made of industrial requirements. No other crane of similar capacity can show such terrific economy in BOTH OPERATING AND MAINTENANCE COSTS. A few users report maintenance cost LESS than on average fork lift truck. ECONOMY of gas is only one of the many COLES BONUS features.

A Mobile Crane is the Most Flexible Lifting Tool Yet Designed!

● The Coles Crane is the most flexible of mobile cranes, having 360° full circle swing, cantilever type boom, and reversible steering. Every conceivable SAFETY DEVICE is fitted as standard on every COLES CRANE. These devices are designed to protect the Operator, the equipment and your investment. In Fact, COLES is the outstanding crane—that gives the Material Handling Engineer—remote control over his operator. When considering the purchase of a mobile crane—it will pay you to investigate COLES.



WRITE FOR CATALOG

Information pertaining to several models with complete specifications and illustrations of the various lifting operations yours for the asking.



The name that carries weight
in material handling!

COLES
CRANES

COLES CRANES, INC., 942-F JOILET, ILL.

Circle No. 33 on Reader Service Card for more information

Tape Printer:

Literature about a portable office tape printer may be obtained from the Mark' Andy Inc. Your company advertising or slogan may be imprinted on your pressure sensitive tapes or gummed sealing tapes as you need them. Rubber printing plates are said to be interchangeable in seconds. A standard 72-yard roll can be printed and re-wound in three and one-half minutes.

Circle 202 on Reader Service Card

Rugged Earth Truck:

Rough hauling on excavation jobs or around mines and quarries sounds easy, according to literature available from Aveling-Barford Ltd., of Grantham, England, in describing its Mark III Shuttle Dumper. Diesel powered, the dumper carries $4\frac{1}{2}$ cubic yards and affords positive dumping of the stickiest loads. Its dual steering and pivot seat feature permits the driver to face in the direction of his travel without turning the

truck around, thereby making the shuttle truck a true reality. It has four speeds in either direction. Oversized tractor-type drive wheels give excellent traction under the most adverse conditions.

Circle 203 on Reader Service Card

Electric Worklifter:

Literature emphasizing the special features of the Worklifter portable electric elevator is available from the manufacturer, Economy Engineering Co. The low price battery operated unit has a built-in battery charger that operates from any 110 volt electric outlet. Battery can be charged even while in use, states the folder. Eight-inch wheels permit easy maneuverability, while dependable floor lock assures rigidity during operation.

Circle 204 on Reader Service Card

Pneumatic Conveyor:

An eight-page folder presenting details about pneumatic conveyor applications may be obtained from the Holly Pneumatic Systems Inc. Numerous loose bulk materials lend themselves to this type of conveyance whether it be into or out of storage bins or transport vehicles or cars.

Circle 205 on Reader Service Card

Variable Speed Drives:

A folder No. 2374 offers complete description of the Link-Belt Co. P.I.V. positive, infinitely variable speed drives, which are now available in two new types for 20 to 25 horsepower applications. The complete Link-Belt line includes P.I.V. drives in eight sizes ranging from one-half to 25 horsepower capacity.

Circle 206 on Reader Service Card

Dehydrated Packaging:

Literature about moisture-vapor barriers is available from the Davison Chemical Corp. in describing its Protek-Sorb 121 Silica Gel desiccant used in drying the air enclosed in a vapor-proof package.

Circle 207 on Reader Service Card

THE TURNER SYSTEM OF MATERIALS HANDLING

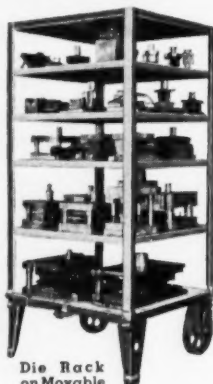


Bin Sections on Turner Transports double stacked with special Stacking Unit.

**"There's Always
Room at the Top!"**

**STACK IT
HIGH
with these
TURNER UNITS**

You may be able to save up to 50% of your floor space simply by using the proper Turner Units, all of which embody unique stacking features. Much greater efficiency usually results — in addition to big savings in space, labor and equipment. It pays to know how the TURNER SYSTEM can cut costs in your plant.



Die Rack on Movable Transport.

**Write Today
for Your
Copy of the**

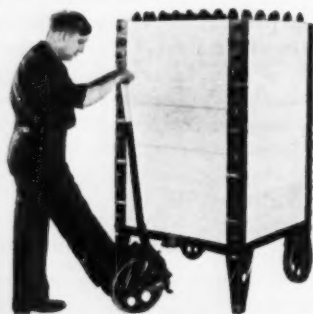
NEW TURNER SYSTEM

BOOK

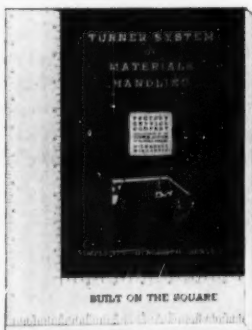
- Pallets
- Transports
- Die Racks
- Shelf Racks
- Super-Structures



Rugged 8-way stacking pallets — 3 types.



"DELIVER THE BIN AND SAVE THE HANDLING" with the Turner Transport. Moved by hand Jimmy, power lift truck, crane or tractor.



This new book shows you how to increase profits by reducing handling costs — send for it.

FACTORY SERVICE COMPANY
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Circle No. 46 on Reader Service Card for more information

SHOCK & VIBRATION...

(Continued from page 109)

counter, and a knowledge of available packaging and packing materials, we can begin the design and subsequent perfection of a package that will do the job.

We have mentioned factors about which we need to have knowledge in order to scientifically engineer our package. These important factors can be summarized under four general headings.

1. Physical characteristics of the item to be packaged.
2. Conditions the package will encounter.
3. Applicable shock and vibration phenomena.
4. Available packaging materials.

We can readily obtain the answers to factor number one by study of the item itself. As to factor number four, we need only look around us and make reference to our trade journals to have knowledge of available packaging materials. And, a fairly good remembrance of elemental mathematics and physics will provide sufficient knowledge of shock and vibration phenomena, taking care of factor number three. That leaves unanswered factor number two, "Conditions the package will encounter." Our present knowledge of the impact loadings, amplitudes and frequencies of vibration, and their duration and sequence as experienced by packages in common freight carriers is not complete. True, some statistics and figures are available, but not sufficiently comprehensive or reliable. This lack of good data as to shock and impacts produced by common freight carriers is mentioned because it leaves our laboratory test procedures without an accurate yardstick or gauge. While it may be profitable to measure one package design against another, we really need to measure our package design against the conditions it will actually encounter in order to obtain the optimum in economy and effectiveness.

Considering the shock and vibration aspect of our packaging prob-

lems, it seems desirable to establish the conditions we must provide for in our packaging and to establish meaningful tests and means for evaluating the results.

That we are doing better today than we were a few years ago is evidenced by the more scientifically conceived test apparatus and the wider application of analytical approach to shock and vibration isolation in packaging. Much has been done, much is being done, and a great deal more needs to be

done to establish for the packaging engineer accurate criteria for conducting laboratory tests which faithfully reflect shock and vibration phenomena which the packages will meet in the field.

The Corps of Engineers Packaging Development Laboratory has a shock and vibration program aimed at gathering sufficient data on field conditions to provide a basis for the scientific design and testing of packages. Contracts with the University of Florida and with



A-F **LIVE RAIL***
"SINGLES"
**GIVE
LOWEST COST
MOVEMENT
TO PRODUCTION**

100% PORTABLE

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... like an extra crew, Live Rails may be quickly, easily moved to any spot and set up as you wish to move any flat bottomed object. No need to pay for rows of needless wheels if just 2 Live Rails will do the job. Available in 5 ft. and 10 ft., straight and curved. Also complete sections ... Your best wheel-style portable buy. Write for prices — today.



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1 man



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Sheet Steel
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with a
C-F LIFTER**

C-F Lifters, under one man operation, pick up, carry and unload more sheet steel tonnage per hour than any other method - and at lower cost per ton. Wide carrying angles hold sheets securely - won't damage high grade sheets; tong action insures safe carrying; fast opening and closing adjustments of Lifter jaws permit shifting from one size pack to another in seconds. C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons.

Write for Bulletin SL-28 for specific examples of C-F Lifter operation and economy.



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Make certain that you are using the most economical pallet. Order a trial car of RAZORBACK Brand and compare them with those you are now using. RAZORBACK Brand prove their economy in longer life and lower maintenance cost. Call or write for prices today;

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PINE BLUFF, ARKANSAS



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130

CUT YOUR HANDLING COSTS!

With Osborn's Platform Skids
and Bottomless Stacking Rings



Type L-2500#
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Angle Iron Bound
Hardwood, Heavy
Bar Steel Formed
Legs

Replaceable Decks
Built for Hard
Usage with Min-
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Distributors' Inquiries Invited

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SHOCK VIBRATION

Continued

the Battelle Memorial Institute have resulted in assembling of available information on field conditions and instrumentation presently in use.

A contract is now in progress with Reed Research Laboratories for the design of a shock recorder that should be capable of operating unattended for a period of three weeks. With this instrument, it should be possible to obtain an accurate measure of field conditions. It will take time to gather enough data to be statistically reliable, but once this is available we will have established shock conditions the package will encounter.

At the present time, however, this lack of knowledge must be bridged by trial and error methods of isolating shocks and vibrations which we anticipate will be encountered. Let us analyze the problem.

In order for mechanical damage to take place, energy must be expended, and the energy expended to induce shock and vibration involves one or more forces and motion. We must measure the forces involved so that we may know the magnitudes that will cause damage to a given item. The studies at Fort Belvoir have involved two types of energy load, the static load and the dynamic load. There are two distinct types of dynamic shock load to which an item in transit may be subjected. They will be designated here as an *impact* load and an *impulsive* load. An *impact* load may be described as that action taking place when a weight strikes a structure. In this case the problem of determining the effect of such an action involves the mass and velocity of the striking weight. An *impulsive* load is described as a dynamic load that is applied to a structure in which there is no striking action present and as such the dynamic load is not a function of the mass of the element that apply this load. To illustrate these dynamic loads, a dropped container receives an *impact* load whereas the cushioned contents receive an *impulsive* load.

Acceleration has been found to be a useful means of measuring the energy involved in shock loads. The expression of acceleration or deceleration in units of "g" (the acceleration due to gravity) has become common among scientific personnel the world over. To a packaging man, the "g" factor of an item is a measure of its fragility. If it is subjected to 1 g acceleration, it has a force acting on it equal to its own weight. Similarly, 10 g's acting on it would produce a force equal to ten times its own weight.

Deceleration

In packaging we are generally more concerned with the forces produced by deceleration than those produced by acceleration. We can easily explain the effect of deceleration if we think of standing in a bus and being thrown off balance when the bus suddenly stops. If the person involved rigidly maintains his position even though the bus stops abruptly, he will certainly feel the force involved due to the rapid deceleration. On the other hand, he would not feel the jolt of the stop nearly as much if he were to allow himself to be carried forward somewhat, thereby increasing his time of stopping.

Another type of dynamic loading to which a package in transit may be subjected is vibration. An imposed vibration of the same frequency as the natural frequency may cause no damage. The former case, in which the ratio of the frequency of imposed vibration to the natural frequency of the vibration isolation system is one, causes severe resonance conditions. It has been found that this ratio should be at least $\sqrt{2}$ in order to keep safely away from these conditions. In a complex piece of equipment, the components may have resonant frequencies of their own. These frequencies must not be permitted to pass through the cushioning system. This presents a problem; for if these frequencies are low, a stiffer cushioning system is required which, unfortu-

nately, does not provide a good shock protection system.

Shock and/or vibration isolators for a packaged item can be supplied by means of a wide variety of materials, mechanical systems, and ingenious arrangements. Common cushioning materials used in packaging are excelsior, cotton batting, hair felt, fiberboard pads, shredded paper, fiberglass, foam rubber, etc.

Mechanical shock and vibration isolators include springs, rubber

and metal mounts, hydraulic cylinders, pneumatic pads, etc. And, of course, many combinations of cushioning materials and mechanical systems are employed.

So far, there does not seem to be any one ideal material or system, nor does it seem probable that any one material or system suitable for all combinations and to meet all problems will ever be found. Each kind of cushioning material, and each of the many shock mount systems has certain

BOOST PRODUCTIVE MAN HOURS... CUT HANDLING COSTS

with



**SAVE TIME . . . LABOR . . .
DOLLARS IN HANDLING**

Make every man hour count in your plant . . . cut down slowdowns in materials handling with Wayne Lifts. From loading platform to production line there's a Wayne Lift to save you time, labor and money. Every one is "precisioneered" . . . made to last for years without trouble . . . designed for easy servicing.

Wayne Engineers, utilizing "LIFTronics", offer a complete engineering service to establish the most efficient and practical solution to your lift problems. Each Wayne Lift—loading dock, cross-over bridge, materials lift, service lift—is custom-engineered to your plant's particular needs. Take the first step to improving your materials handling, write for "LIFTronics . . . science of materials handling."

THE WAYNE PUMP COMPANY

Salisbury, Maryland • Toronto, Canada



WAYNE LIFT DIVISION, Salisbury, Md.

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Circle No. 80 on Reader Service Card

MERRILL MATERIALS HANDLING DEVICES

LIFTING CLAMP **TWIN LIFTER**

HAND GRIP **DRUM TILTER**

DRAG CLAMP **DRUM OPENER**

MERRILL BROTHERS
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SHOCK & VIBRATION

Continued

advantages over others, and each has certain disadvantages in particular applications.

We might express, in general terms, the means by which we use knowledge of shock and vibration phenomena to analyze a package. The conditions imposed on a package in the laboratory are well defined. By measuring the conditions that the item in the package actually encounters, the cushioning effect of the intermediate material can be determined.

For making the necessary measurements, the Corps of Engineers Packaging Development Laboratory has developed a shock and vibration recording system. Accelerometers are used as sensing elements. The system will sense, measure, and record amplitudes and frequencies of shocks and vibrations. It will record accelerations

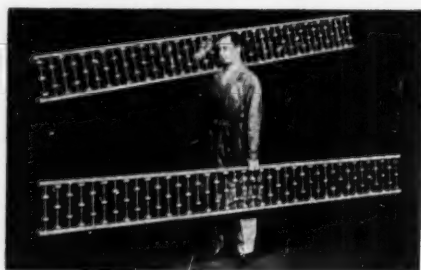
to 80 g's and has an over-all frequency response of 2 to 500 cycles per second.

By means of reactions recorded with this equipment, analysis can be made of performance of protective packaging materials and techniques such as shipping container construction, blocking, tie-down, and cushioning. This means of measuring and recording packaging shock and vibration test results makes possible determination of exact source and cause of damage occurring to a packaged article in transit.

The problem of packaging shock and vibration cannot be minimized. When carefully examined and all its aspects are developed, it is found to offer a profitable and important area for investigation. We have briefly touched on some of the basic aspects of the packaging shock and vibration problem. It is evident that it must be taken into consideration in the design of packages.

Speedways gives you important EXTRAS

with the
NEW
Aluminum
Gravity
Wheel
Conveyors



- EXTRA Portability:** The feather-lightness makes them easier to lift and move. Cuts set-up, knock-down and stow-away time, makes even your smallest-sized worker capable of handling these chores with complete ease and safety.
- EXTRA Strength:** 33 1/3% lighter than steel, yet stronger, tougher and with the same capacity of steel conveyors. They'll move 850 lbs. of live load per 10 lineal feet!
- EXTRA Utility:** Speedways Aluminum Gravity Wheel Conveyors will work for you in every phase of your material handling, plus having extra utility in danger areas where the non-sparking aluminum frames help reduce hazards.
- EXTRA Savings:** Add up these extras! They mean savings in material handling costs . . . in labor time. . . They mean reduced accidents and production speed-up.

GET THESE EXTRAS — with SPEEDWAYS' NEW ALUMINUM GRAVITY WHEEL CONVEYORS

See your SPEEDWAYS Distributor or write today for new Aluminum Gravity Wheel Conveyor Bulletin. No obligation, of course. Write Dept. F-12.

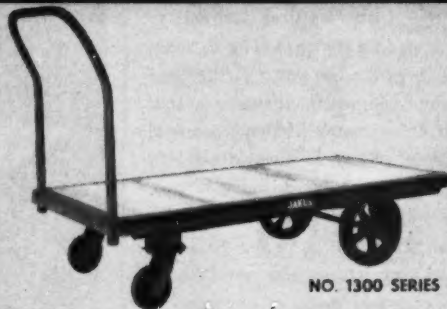
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JAKES

America's Finest
Industrial Trucks and Trailers



Capacity 2200-2500 pounds. Kiln dried hardwood deck.
Double steel angle frame. Metal, rubber or plastic wheels.
Various platform sizes.

JAKES FOUNDRY COMPANY

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**THESE SILENT HOIST
WORK HORSES WILL
SAVE UP TO 75%
IN TIME AND LABOR COSTS**



**HEAVY-DUTY FORK
LIFTRUK**
5-7½-10-15 TON CAPACITIES

The heavy-duty "Silent Hoist" LIFTRUK and LIFT-O-KRANE feature fast handling of unbalanced and capacity loads, with maximum stability . . . high lifting range . . . short turns in narrow aisles create added acres to your storage space.

These SILENT HOIST features add up to faster inloading, most efficient inter-plant handling and scientific stacking, quicker out-loading to truck, trailer or car, with time and cost savings, very often up to 75%.



35th
YEAR

SEND FOR BULLETIN 75 on LIFT-O-KRANE and BULLETIN 77 on LIFTRUK.

Either machine can be supplied with RAM attachment.



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Pioneers of Heavy Duty
Materials Handling Equipment

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British-American Cooperation

J. P. Lawrence, President of American Monorail Co., and Sir John Dodd, Director of British Mono Rail, Ltd., have agreed to complete cooperation in the production and world-wide distribution of monorail type overhead handling equipment.



The agreement was reached in a meeting at Cleveland, on November 9. Shown are, left to right: Sir John Dodd; J. P. Lawrence; and B. C. Flynn, British Counsel.

The firms have had an agreement in effect since 1951, but it covered limited operations in the textile field because of restrictions in England. These have been removed, and the two companies are now ready to promote monorail applications throughout all England and the Continent.

PRODUCT DESIGN . . .

(Continued from page 107)

The objective of this paper is to outline some of the factors related to this relationship between material handling and product design.

A material handling engineer usually has sufficient engineering background and knowledge of plant procedures to be able to make decisions for the best material handling methods. The cycle of handling under his responsibility should start with the incoming materials, whether in a raw or finished state—through the production phases, to packing, storage, and shipping—ending with de-



2 great new ELECTRIC AUTOETTE Pickup Trucks

Electric AUTOETTE Pickup Trucks are ideal for all types of light hauling in industrial plants . . . docks and warehouses . . . resort hotels . . . movie lots . . . golf courses . . . estates and ranches.

Both the ¼-ton and ½-ton AUTOETTE Pickups are sturdily built to give years of dependable, trouble-free service. Because there's no engine or complicated parts, AUTOETTES are free from costly repairs and adjustments.

Costs only 3¢ a day

AUTOETTE Pickup Trucks are famous for their amazing economy. Only 3 cents for electricity for 12 hours of daily hauling—30 miles of travel. Less than a dollar a month—\$10.00 a year—1/5 cent per ton-mile!

At the end of the day, just plug the Taper Charger into any electric outlet. The batteries are charged overnight—ready for another day of perfect service.

AUTOETTE Pickup Trucks sold by:

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Los Angeles, Calif.
- Blood Enterprises, Inc.
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For complete information and colorful AUTOETTE brochure, sign and return coupon below.

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Please send complete information about
AUTOETTE Pickup Trucks

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Address.....
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GOES PLACES IN NARROW SPACES—

Revolvator Go-Getter Powered Hand Truck permits maximum use of storage or production areas. The compact model shown above is a Hi-Straddle Lift with fingertip control—fully automatic 200° turning arc—slight operator training. Let us know your problem and we'll help you solve it. Phone or write Revolvator Co., 8739 Tonnele Ave., North Bergen, N. J., UNION 3-8120.

PRODUCT DESIGN

Continued

livery to the district sales warehouse or to the user. By having under his jurisdiction these fields of activity, he can establish methods of handling and distribution to assure delivery of products in good condition to the customer. He must always keep in mind the improvement of handling methods and reduction of costs, consistent with quality.

I have seen some splendid demonstrations of the material handling engineer's ingenuity in developing methods of handling and shipping items and machines of complicated designs to maintain low costs and yet give adequate protection for safe delivery. He realizes some designs cannot very well be changed and he will do his best to take care of them.

A better understanding of product design by the material han-

dling engineer will do much to provide a full measure of cooperation.

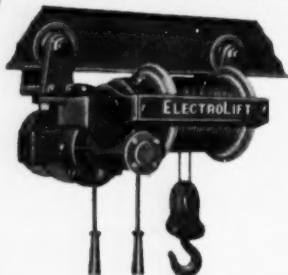
What About The Product Designer?

Every time I visit with the farmers and observe the operation of the mechanical farm machines, I marvel at the inventive genius of the designers back of these machines, and realize the drudgery they have taken out of farm work. Here is a vivid example of how a terrific problem in material handling has been solved.

Product designers have before them constantly the demands of the user and the economy of manufacture. They must have in mind also machines that will operate efficiently and economically and will meet competition. Designers have sufficient knowledge of manufacturing processes to know how newly designed parts will be adaptable to rapid and accurate production.

Perhaps the average product designer needs to know more about

10 advantages of ELECTROLIFT WORM DRIVE HOIST



- automatic electric brake
- hoist drum fully grooved
- motor hoist fully enclosed
- automatic lubrication
- hoist gearing fully enclosed
- worm shaft alloy steel
- worm load brake holds load
- drum guards protect cable
- no overhung gears
- optional pushbutton control

ELECTROLIFT

ElectroLift, Inc., 30 Church St., New York 7, N. Y.
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Completely New!

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Packaging and Shipping Equipment . . .
Supplies.

A new "Tab Index" makes it easier than ever before for you to find any of the following outstanding information-packed sections:

1. Engineering and Technical Data
2. Who Sells or Rents Equipment
3. Trade Mark Index
4. Manufacturers' Catalogs
5. Product Classifications

Your FLOW DIRECTORY is your own library of authoritative information about material handling equipment and accessories. Order it now, at the special pre-publication price of \$5.00 (After publication, the price will be \$6.50).

FLOW DIRECTORY

1240 Ontario Street

Cleveland 13, Ohio

today's material handling methods. A closer working arrangement between designers and handling men will be of mutual benefit. Important factors to be considered by both groups include cost control, quality of product, effect on personnel relations and organization interest in the program.

Thinking strictly in terms of dollars and cents, we might ask—

- a—What effect would changes in design for less handling have upon handling costs per ton?
- b—How much would packing costs be lowered by less cubic displacement?
- c—How much less storage space would be required by redesign, thus reducing rented space or lowering the building requirements?
- d—To what extent would the annual railroad loss and damage of over \$100,000,000.00 in commodities be lowered if designs would allow safer loading?

I visited the testing laboratory of the Association of American Railroads in Chicago recently with Ed Dahill, Chief Engineer, and learned of the fine work being done with shippers in suggesting design changes to reduce excessive loss and damage. This is especially true with fragile items of which there were a variety in the laboratory. I was told designers at times are invited into this laboratory to discuss suggested changes indicated by laboratory tests and shipments.

Some industries operating under the statistical quality control method are co-operating with designers where inspection reveals excessive failures or rework. Controls of this kind point out weaknesses in design and are an aid to designers.

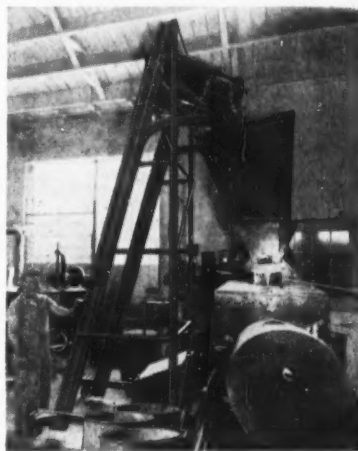
If this relationship is approached in the right manner, I am sure material handling men will find product designers very willing to co-operate.

The material handling engineer will be asking the question—"What methods can you recom-

CESCO DUMPER REDUCES ACCIDENTS DUE TO MATERIALS HANDLING

"The National Safety Council gave top billing in 1949 to materials handling for causing a quarter of all temporary total disability accidents. Of these 85% were caused by lifting."

The above paragraph calls attention to a growing concern for loss in man hours and money due to the hazards of materials handling. However, the Colson Equipment & Supply Co., of Los Angeles, California, recognizing the seriousness of the



problem has designed lifting equipment which has substantially reduced this type of accident wherever used, called the "Cesco Dumper."

This new power hoist lifts, upends and dumps bags, boxes, drums and barrels to load bins, vats and mixers. By eliminating manual lifting entirely, records show that the number of accidents due to muscular strains, hot, splashing liquids and spilling corrosive acids have substantially lowered.

The CESCO Dumper, with a lifting capacity ranging from 100 to 1500 lbs., handles up to 100 loads, or approximately 75 tons per hour. Widely used by manufacturers throughout the country, it has shown labor savings up to 33-1/3% in handling food ingredients, ceramic materials, fertilizers, liquids, metal parts and other materials including waste, rubbish and broken glass.

According to the manufacturer, their hoist can be equipped with a variety of skips and loaders and moves on its own casters, locking in place with two floor locks. Push button control allows one operator to lift and dump various items mechanically. The CESCO Dumper is manufactured in standard dumping heights of from 5 to 12 feet and in other sizes to order. Three button control, up, down and stop, halts travel instantly without coasting.

Complete information may be obtained by writing Colson Equipment & Supply Co., 1317 Willow St., Los Angeles, Calif., or the CESCO Dumper Division of Essex Conveyors, Inc., 165 Franklin Ave., Nutley 10, N. J.

Adv't.

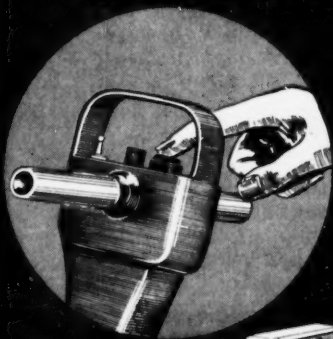
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Hydroelectric LIFT TRUCKS

give you true "Finger Tip Control"



Want more facts about this fine power lift truck? Write to:



LIFT TRUCKS
INCORPORATED

2423-31 SPRING GROVE AVE.
CINCINNATI 14, OHIO

There is a model for every purpose to handle any kind of material.

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FLOW • DECEMBER, 1953

5 FEATURES that make load-lifting

with a marforge EASIER

- **LIFTING ACTION** requires only 30-lbs effort, while standing erect . . . no bending . . . no crouching
- **STEERING** made easier by double ball-bearing 5th wheel (5" dia.)
- **LOWERING SPEED** controlled, protecting fragile loads
- **MANEUVERABLE** wherever a man can stand — Does not block aisles when lifting
- **PULLS EASIER** because of sealed ball-bearings in each wheel, and large diameter (10") front wheels



**1953 SKID
LOAD LIFT**

Capacities up to 10,000 pounds
Widths — 18" and 24" Lengths — 24" to 72"
For 6 1/2", 7 1/2", 9 1/2", 11 1/2" Skid Platforms
Standard Lift 3". Special Lifts to 8".

**WRITE FOR
FREE TRIAL OFFER.**

56 Years In The Materials
Handling Business

Market Forge Company
EVERETT, MASSACHUSETTS

Trojan TRACTOR FOR POWER TRAVEL



and walk along with the load →

Trojan MONORAIL TRACTOR

Write for Bulletin 810.

With a simple, draw-bar attachment, the Trojan quickly converts slow, hand-travelled hoists, small cranes, and other material handling units to fast, power-travel. Save time and effort; speed up production.

DETROIT HOIST & MACHINE CO.
48th Year—Designers & Manufacturers
Hoists and Cranes Since 1905

8239 Morrow St., Detroit 11, Mich.

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RED-E DUMP TRAILERS

**EASIER, FASTER,
SAFER HAULING!**



**LOW CENTER
OF GRAVITY**

**No Tip-Overs—
Weight is Balanced
at Axles—
Not Above Them!**

For both in-plant and yard work, move dirt, sand, trash, shavings, scrap, etc. the SAFE way . . . with Red-E Trailers. Specially designed for super-stability, simplest operation over any terrain. 1 1/2 ton capacity, with 104" overall length, 41"-50" width hub-to-hub, 84" wheelbase. 4-wheel or 8-wheel models available, with pneumatic or zero-pressure tires. (Also with heavy-duty stake body.) Easy, safe 5th-wheel steering for sharpest turns; Fulton trailer hitches for 3-5 unit trains. Rugged, practical, safe—Red-E No-Tip Trailers are engineered for all-around work. Adjusts to 14, 18, 24 or 32-inch height for easy loading!



**WRITE FOR FREE LITERATURE
RED-E TRACTOR CO.
RICHFIELD, WIS.**

Circle No. 102 on Reader Service Card

PRODUCT DESIGN

Continued

ment to help me carry out this plan to the best advantage in my operations?"

Based on an initial survey made in selected industries, I believe the following recommendations should have general application.—

A sound product design—material handling co-ordinated program should have the blessing of the executive staff. The planning is a function of those responsible for overall material handling programs, co-operating with managers or chiefs of engineering. The procedures should be carefully developed in all phases. The manner of presentation will have an important bearing on its acceptance.

The actual application of the program at the plant level will rest with the material handling engineer. If he does a good job, he should have no difficulty in receiving the help of the design engineers and others interested.

How A Material Handling Laboratory Assists in Product Design

A material handling laboratory has a duty in recommending design changes for better material handling. Material handling engineers must work closely with the laboratory and have a great deal to do with originating projects from their particular operations.

In one large automotive company, the material handling laboratory has one of their engineers on the committee responsible for new designs. With this advance knowledge, this laboratory has the opportunity to make pilot parts for handling and shipping studies. Through these developments in their laboratory they recommend changes in original designs resulting in very large annual cost reductions.

A material handling laboratory has an important part to play in the conservation of critical materials used for handling facilities, packing and loading. They can be of help to designers in keeping them informed of how the materials used to facilitate handling and shipping can be used to best advantage. In the American econ-

omy, we must give serious thought to this question of conservation of material resources. In our field of work, we must conserve such items as lumber for crating, pallets and blocking, steel for nails, bolting, reinforcements, bands and wires, paper for cartons, cushioning and wrapping and other similar materials being wasted on a grand scale.

Vendors' Designs

Many industries today adopt component items produced by reputable manufacturers, which are assembled into complete machines. In the automotive field, we find some makes of cars and trucks contain more than 50% of these purchased items.

The general experience has been that in most cases these vendors will co-operate with material handling engineers to facilitate handling.

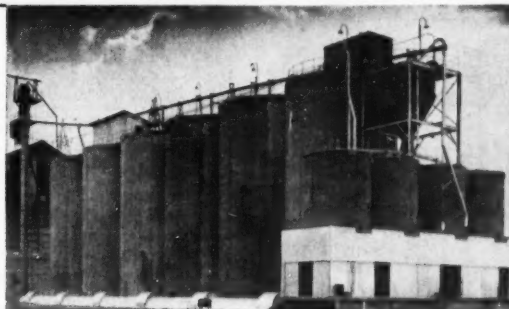
Prominent in the group of purchased items are generators, carburetors, complete axles, chassis frames, wheels, radiators, transmissions and steering assemblies for the automotive industry, most of the interior parts and assemblies for refrigerators and freezers, and a long list of many precision items for practically all of the operating machines manufactured today.

Material handling engineers of receiving plants, usually know enough about these vendors' items to assist in their handling and shipping problems. This co-operative effort is gaining ground. Some plants have continuous surveys in effect with their suppliers for better handling methods.

Occasionally, material handling engineers find that vendors' designs involve costly handling, shipping or storage requirements. By working with design and production staffs at both industries, the material handling engineer has many opportunities to improve handling procedures of mutual benefit to the vendor and his customers.

May I again emphasize to you men here today, especially those having assignments in material handling, how vital it is to you to broaden your fields of activity. In my opinion, never has there been such a spontaneous awaken-

Circle No. 87 on Reader Service Card for more information



Trainloads of Alumina

Knowing that these ten Neff & Fry storage bins will hold 6,280 tons of alumina, you can imagine the potential quantity of products therein—grinding wheels, ceramics, pots, pans, truck and car bodies, girders, struts, sidings, roofs, paints, etc., etc.

The six larger ones are 30' dia. x 60' high; the four others, 15' x 16'. They are owned by Reynolds Metals Company and located at Bauxite, Ark. The bins are filled and emptied by means

of air slides.

This is just one example of Neff & Fry installations for handling and storing 85 kinds of flowable bulk materials—coal, grain, sand, ore, cement, clay, limestone, salt, soda ash, wood chips, for example.

Much of our work is building additional bins for old customers. They know Neff & Fry bins. You ought to be wise, too, if you produce or use flowable bulk materials. Ask for our literature.

THE NEFF & FRY CO. • 110 Elm St. • Camden, Ohio

SUPER-CONCRETE STAVE STORAGE BINS

Safer . . . Happier



thanks to
Christmas Seals!

Like a protective radar network, a barrier formed by Christmas Seals helps to guard us against tuberculosis.

The money which you donate for Seals fights TB the year round—with continuing medical research, education, rehabilitation, and case finding.

To keep the barrier high, send your contribution today, please, to your tuberculosis association.

Buy Christmas Seals

Because of the importance of the above message, this space is contributed by

FLOW

NOLAN ONE-MAN CAR DOOR OPENER



Opens Doors in 20 seconds or less!



The Nolan Car Door Opener gives one man a tremendous amount of pulling energy, to get the most stubborn, hard-rolling door wide open in a hurry! Now chain has 2000 lbs. tensile strength. No gangs needed. No mangled limbs or loss of life. A few quick pulls on anchor chain gets any door open in a jiffy. The NOLAN saves its low initial cost in first hour of operation.

New safety and efficiency features now make the Nolan 1-Man Car Door Opener a more necessary labor-saving money-saving help than ever before.

Many thousands in constant daily use!

Free Literature. Order one or more NOLAN Model-H Car Door Openers now. Catalog on request.

The NOLAN Co.,
110-C Pennsylvania St.
Bowerston, Ohio

\$37.50

F.O.B. Bowerston

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You can do it with One Man and a Prime-Mover!

Move your materials—bulk or packaged—with equipment not limited to specific jobs—Consolidate those intermittent handling jobs, outdoors or in confined areas—Supplement and relieve your specialized equipment and complete the mechanization of your materials handling.



If you're processing bulk materials—disposing of waste and scrap—using materials in maintenance or construction—shifting heavy maintenance equipment—maintaining grounds—or loading, unloading bulk or packaged goods from cars, toss your problems on the Prime-Mover and get the job done—quickly and economically.



Wisconsin engine powers an all enclosed gear drive to propel front wheels located under the load—(Up to 1/4 ton.)
Passes through narrow aisles and doorways. Turns in own length. (6 ft.)
Does hard rugged jobs—up and down grades and over all types of surfaces.

THE PRIME-MOVER CO.
Muscatine, Iowa



PRODUCT DESIGN

Continued

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materials handling

Professionally planned for cost reduction

In today's competitive market—cost reduction through planned Materials Handling assumes major significance in profitable operations.

Without obligation, our experienced engineers will make a preliminary survey of any plant or problem to determine the potential savings and the cost.

We invite your inquiry

Gemar Associates
CONSULTING
**MATERIALS HANDLING
ENGINEERS**

Greenwich, Connecticut
Over 20 Years' Experience



Single cyl.
3 to 9 H.P.



2-cylinder
7 to 15 H. P.



V-type 4-cyl.
15 to 36 H. P.

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Fit the Job and the Machine

Because Wisconsin Air-Cooled Engines are supplied in a complete power range, from 3 to 36 H.P., in 4-cycle single cylinder, 2- and 4-cylinder types, there is an ideal size to fit all types of machines and power applications within this range, without wasted power and with maximum power service benefits. Heavy-duty construction, combined with extremely compact design and light weight are added advantages—and dependable AIR-COOLING permits trouble-free service under all climatic conditions.

Specify Wisconsin Heavy-Duty Air-Cooled Engines for the utmost in power satisfaction. Write for descriptive data.



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You can do it with One Man and a Prime-Mover!

Move your materials—bulk or packaged—with equipment not limited to specific jobs—Consolidate those intermittent handling jobs, outdoors or in confined areas—Supplement and relieve your specialized equipment and complete the mechanization of your materials handling.



If you're processing bulk materials—disposing of waste and scrap—using materials in maintenance or construction—shifting heavy maintenance equipment—maintaining grounds—or loading, unloading bulk or packaged goods from cars, toss your problems on the Prime-Mover and get the job done—quickly and economically.

Bucket and platform interchangeable in a jiffy.



Wisconsin engine powers an all enclosed gear drive to propel front wheels located under the load—(Up to $\frac{3}{4}$ ton.)

Passes through narrow aisles and doorways. Turns in own length. (6 ft.)

Does hard rugged jobs—up and down grades and over all types of surfaces.

THE PRIME-MOVER CO.
Muscatine, Iowa

The Bell
PRIME-MOVER

PRODUCT DESIGN

Continued

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materials handling

Professionally
planned for
cost reduction

In today's competitive market—cost reduction through planned Materials Handling assumes major significance in

PAC

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Single cyl.
3 to 9 H.P.



2-cylinder
7 to 15 H.P.



V-type 4-cyl.
15 to 36 H.P.

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Fit the Job and the Machine

Because Wisconsin Air-Cooled Engines are supplied in a complete power range, from 3 to 36 H.P., in 4-cycle single cylinder, 2- and 4-cylinder types, there is an ideal size to fit all types of machines and power applications within this range, without wasted power and with maximum power service benefits. Heavy-duty construction, combined with extremely compact design and light weight are added advantages—and dependable AIR-COOLING permits trouble-free service under all climatic conditions.

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World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

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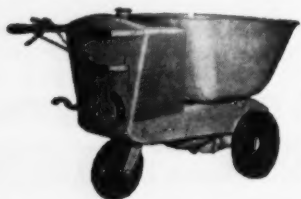
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Single cyl.
3 to 9 H.P.

2-cylinder
7 to 15 H. P.

V-type 4-cyl.
15 to 36 H. P.

MOST
HOURS

WISCONSIN *Air-Cooled* ENGINES

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KALAMAZOO

MODEL 2500

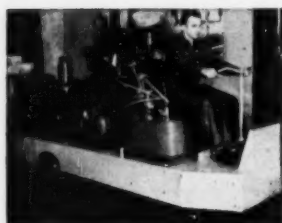
SPEED TRUCK



...key to additional savings in your plant

Equip *Kalamazoo Model 2500 Speed Truck* as a fire truck, lubrication truck, personnel carrier or maintenance truck and save valuable time, often vital minutes, in your plant. *Kalamazoo Model 2500* (shown above) has a deck 48 inches wide and 78 inches long back of the seat. Gasoline powered, the *Kalamazoo* has 15 m.p.h. travel

speed and maneuvers easily through standard doors and narrow aisles. Rugged throughout, the *Kalamazoo Speed Truck* is synonymous with day-in day-out dependability. It will pay you to investigate the versatile *Kalamazoo* for your plant operations.



AS A LUBRICATION TRUCK, *Kalamazoo Model 2500 Speed Truck* saves time in keeping machine tools and other equipment properly lubricated.



AS A PERSONNEL CARRIER, *Kalamazoo Model 2500 Speed Truck* is ideal for plant tours by personnel or visitors.



AS A MAINTENANCE TRUCK, *Kalamazoo Model 2500 Speed Truck* speeds movement of maintenance crews and equipment.



SERVICING OF VENDING MACHINES throughout the plant is accomplished speedily and efficiently with the *Kalamazoo Model 2500 Speed Truck*.



Send for Bulletin ST-4.

KALAMAZOO MANUFACTURING COMPANY

KALAMAZOO, MICH., U.S.A.

Circle No. 68 on Reader Service Card for more information

NEW MAGLINER MAGNESIUM DOCK BOARDS SPEED UP LOADING AND LOWER COSTS

...for Associated Truck Lines!

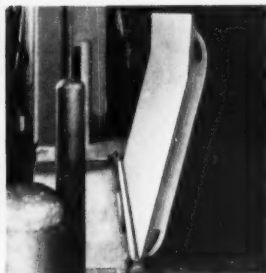
Associated's new Kalamazoo, Michigan, terminal. The building is completely equipped with custom-engineered Magliner permanently-installed dock boards, and its 11,000 square feet of unobstructed warehouse space is designed to spot and service 35 trailers at one time.



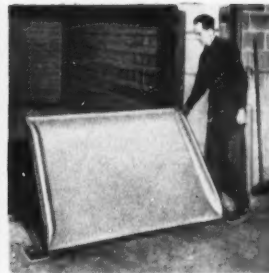
Loading docks with battery of Magliner dock boards in "raised" position. Lightness, low initial cost, automatic self-adjustment, and absence of maintenance were among the many reasons this Magliner permanent installation was specified.



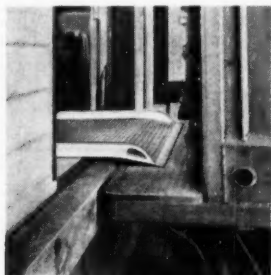
Dock boards in the "down" position and ready for use. The units are recessed into the dock structure, thereby making them flush with the dock to provide safe, secure transfer of cargo between carrier and terminal.



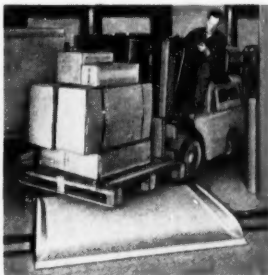
Close-up of installation showing recess and hinge construction. The use of dry babbitt bearings permits simplified, manual operation... eliminates all maintenance problems!



Boards are constructed of heavy-duty, lightweight magnesium. Over 5 feet wide, the units are easily raised or lowered by one man... No counter balances or costly leveling devices of any kind are required!



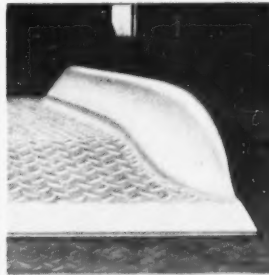
Installation is permanently fixed... recessed into concrete dock. Boards self-adjust to correct trailer floor height automatically; pre-determined angle of bend insures proper contact with trailer floor at all times.



Flared curb ends of cast magnesium permit easier, sharp-angle turns in limited areas. Dowelled-in, welded construction provides double the normal strength at this critical shock point.



The dock boards are designed to accommodate either manually-operated or power-operated equipment. Wide span permits easy cargo spotting in the carrier, and design takes into account low underclearance requirements.



New Magliner "Tire-Saver" curbs prevent metal-to-metal (wheel-to-curb) collision. Contact with curb can be made only by the tires—never the wheel rims, regardless of shock of impact! This eliminates single biggest cause of dock board and tire damage.

Gear your shipping and receiving operations to a new, high level of efficiency! Get peak capacity from your facilities with a Magliner Perma-Dock installation! Magliner magnesium Perma-Docks save you up to 65% in installation costs over other dock leveling systems of similar purpose... and give years of

maintenance-free, cost-free operation. Investigate the countless advantages of having Magliner magnesium dock boards permanently installed on YOUR docks!... Lower your cost of doing business... Write today for complete data, and the name of your nearest Magline field representative.

Write for
Information Bulletin Today

MagLine

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PINCONNING, MICHIGAN

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Make it the Biggest Bonus ever— Give it in U.S. Savings Bonds

If your company is one of the more than 45,000 companies that have the Payroll Savings Plan you *know* what your employees think of Savings Bonds—they spell it out for you every month in their Savings Bond allotments.

If you don't have the Payroll Savings Plan, and are wondering whether your people would like to receive their bonus in Bonds, here are a few significant facts:

- every month, *before they get their pay checks or envelopes*—8,000,000 men and women enrolled in the Payroll Savings Plan invest \$160,000,000 in U. S. Savings Bonds.
- the ranks of Payroll Savers are growing: On June 30th sales of \$25 and \$50 Savings Bonds, the sizes purchased chiefly by Payroll Savers, were 6% and 9% higher than in the corresponding period of 1952.

—Payroll Savers hold their Bonds: 75% of the \$7,400,000,000 Series E Bonds which had matured up to June 30, 1953, were being retained by their owners beyond maturity under the automatic extension program.

—on June 30, 1953, the *cash value* of Series E and H Bonds—the kind sold only to individuals—totaled \$36,043,000,000, a new high.

It costs no more to give your Christmas Bonus in Savings Bonds. To the Payroll Saver, and to the man who buys his Bonds at a bank (because his company does not provide the Payroll Savings Plan) a One Hundred Dollar Savings Bond looks bigger and better than a check for \$75. *Make this a merrier Christmas for every employee. Give the gift that keeps on giving.*

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